

A synopsis of the Rubiaceae-Gardenieae of Ceylon (Sri Lanka)

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Abstract. — The generic limits of tribe Gardenieae for Ceylon are drawn up and the nomenclature of the taxa involved is discussed. Genus *Aidia* Lour. is upheld. *Catunaregam* Wolf is re-established. Section *Ceriscoides* of *Randia* is raised to generic status. Five new combinations are made : *Aidia gardneri* (Thw.) Tirvengadum, *Ceriscoides turgida* (Roxb.) Tirvengadum, *C. campanulata* (Roxb.) Tirvengadum, *C. sessiliflora* (Wall. ex Kurz) Tirvengadum and *C. mamillata* (Craib) Tirvengadum. Two species of *Gardenia* are tentatively treated as new to Ceylon. These will be dealt with in detail in a separate paper. Four genera are excluded. A key to the genera and important synonymy for the genera and species are given.

Résumé. — Les limites de la tribu des Gardéniées de Ceylon sont définies. La nomenclature des espèces retenues est étudiée. Le genre *Aidia* Lour. est maintenu. *Catunaregam* Wolf est rétabli. La section *Ceriscoides* du genre *Randia* est élevée au niveau du genre. Cinq nouvelles combinaisons sont établies *Aidia gardneri* (Thw.) Tirvengadum, *Ceriscoides turgida* (Roxb.) Tirvengadum, *C. campanulata* (Roxb.) Tirvengadum, *C. sessiliflora* (Wall. ex Kurz) Tirvengadum et *C. mamillata* (Craib) Tirvengadum. Deux espèces de *Gardenia* probablement nouvelles pour Ceylan sont signalées et seront publiées ultérieurement. Quatre genres sont exclus de cette tribu. Une clé des genres est donnée ainsi qu'une importante synonymie pour les genres et les espèces.

INTRODUCTION

There has never been a comprehensive review of tribe Gardenieae for tropical Asia since J. D. HOOKER's generic classification of the Rubiaceae (1873). The tribe has never been revised on a worldwide basis although significant attention has been paid to some of the African genera during the past two decades. Previous knowledge of the tribe has been confined to regional floristic investigations. As a result, the limits and ranks of several taxa have remained controversial and profound confusion exists in the group. The whole tribe is extremely heterogeneous, and needs thorough taxonomic and nomenclatural revision.

In the light of extensive preliminary work on the generic delimitation of "Tribe Gardenieae of South and South East Asia" and my present taxonomic research on the re-evaluation of all component taxa of the tribe for tropical Asia, I intend in this paper to discuss briefly the changes that have become necessary in preparation for a treatment of tribe Gardenieae for the Revised Handbook to the Flora of Ceylon. For this, I have examined material from the following herbaria : Ceylon National Herbarium (PDA) ; Madras Herbarium (MH) ; Central National Herbarium, India (CAL) ; Royal Botanic Gardens, Kew (K) ; British Museum, Natural History (BM) ; Royal Botanic Garden, Edinburgh

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(E) ; Rijksherbarium, Leiden (L) ; Arnold Arboretum and Gray Herbarium of Harvard University (A ; GH) ; Missouri Botanical Garden (MO) ; New York Botanical Garden (NY) ; United States National Herbarium (US), Rapinat Herbarium, Tiruchirapalli (RHT) and Muséum national d'Histoire naturelle, Paris (P).

A critical re-appraisal of all the Ceylonese taxa included by TRIMEN (1894) in tribe Gardenieae based on two important characters hitherto not properly interpreted for reasons adduced above, viz. the structure of the ovary and especially the position of the placenta and other taxonomic characters to which so far no sufficient attention has been paid, viz. the stipules, seed structure, pollen morphology and the study of the shoot-sequence systems, particularly of the flower-bearing shoots has made possible the delineation and the keying out of the genera. In addition, a short period of field work in Sri Lanka in October 1977 has given me the opportunity to observe some of the living taxa and to clarify a few problems in this group.

Tribe Gardenieae in my circumscription is a much smaller group than that accepted by J. D. HOOKER. This approach is compatible with the views expressed by BREMEKAMP (1934, 1966) and VERDCOURT (1958).

HISTORICAL REVIEW

TRIMEN (1894) in his treatment of Rubiaceae based his classification on that of J. D. HOOKER (1873) and, therefore, included in his key to genera under "Gardenieae" (seemingly genera 22 to 27, listed on page 291) four genera that do not fall within the limits of the Gardenieae as conceived here. These genera are *Webera* Schreb. (= *Tarennia* Gaertn.¹), *Diplospora* DC. (= *Tricalysia* A. Rich. ex DC. ?), *Nargedia* Bedd. and *Scyphostachys* Thw. *Tarennia* and *Tricalysia* have been relegated by BREMEKAMP (1934, 1966) to the Ixoreae. The disposition of the two other genera must await a detailed review of the neighbouring tribes.

My preliminary investigation has entailed important nomenclatural changes especially as regards the extraordinarily heterogeneous genus *Randia* Houst. ex L. When I first started working on the Gardenieae as a Smithsonian fellow in Washington in 1975, I expressed doubt as to the restricted delimitation of *Randia* proposed by FAGERLIND (1943) and the narrow concept held by BREMEKAMP that the genus was exclusively American. I was inclined to regard *Randia* as a highly variable genus represented in both the New and Old World tropics. But over the past two years, I have had the opportunity to work in several American and European herbaria and to critically re-examine practically all taxa described under *Randia*. The study of abundant herbarium material and the availability of more recent collections together with extensive information from literature have amplified my knowledge of the group. Consequently, I am convinced that *Randia* (sensu stricto) is an exclusive American genus characterized by its one-celled ovary with

1. In SALDANHA and NICOLSON (Fl. Hassan Distr., p. 591, 1976), I pointed out that the transfer of *Rondeletia asiatica* L. to *Tarennia* by K. SCHUMANN (in SCHMIDT, Fl. Koh Chang, p. 182, 1891 ; Bot. Tidsskr., p. 332, 1902) had been overlooked by several authors, including ALSTON (1931), SANTAPAU H. & Y. MERCHANT (1961) who published the combination. The correct combination, however, should read *Tarennia asiatica* (L.) O. Kuntze ex K. Schum.

parietal placentas, seeds embedded in a non-waxy bluish pulp, unisexual flowers, pollen in permanent tetrads, distinct testa cells and the absence of leaders with serial formation of buds.

RIDLEY (1939) was the first to draw attention to the heterogeneity of *Randia*. He accordingly raised one section of *Randia* (J. D. HOOKER's section *Anisophyllea*) to generic status and named it *Porterandia*. FAGERLIND (1943), a few years later, observed that a thorough revision of *Randia* (sensu lato) would necessarily lead to the establishment of several new genera. He reinstated *Rothmannia* Thunb. and described a new genus *Rosenbergiodendron* F. Fagerl. (1948). Following him, TAYLOR (1944) re-established *Aidia* Lour. KEAY (1958) recognized twenty one genera including seven new in the African *Randia-Gardenia* assemblage.

The segregation of the *Randia* complex has since been consistently accepted by succeeding workers including BREMEKAMP (1956, 1957), WHITE (1962), PETIT (1964), HALLÉ, F. (1967) and HALLÉ, N. (1970). More recently, YAMAZAKI (1970) revived *Oryceros* Lour. and described the new genus *Himalrandia* to accomodate an Asiatic species of J. D. HOOKER's heterogeneous section *Eurandia*. In my manuscript on the Gardenieae of South and South East Asia, I have tentatively attributed a number of Asiatic species under *Randia* to other or new genera. In a recent contribution towards the plants described in RHEEDE's *Hortus Malabaricus* (TIRVENGADUM, 1978?), I have re-established *Catunaregam* Wolf (1776), an overlooked validly published name, to replace *Xeromphis* Raf. (1838), a generic name re-applied to this genus by KEAY (1958), MAHESHWARI (1962) and others.

GENERALITIES

TRIBE GARDENIEAE IN CEYLON

As interpreted here, Gardenieae in Ceylon comprises *Byrsophyllum* Hook. f., *Gardenia* Ellis, *Aidia* Lour., *Catunaregam* Wolf and a new genus *Ceriscoides* (Hook. f.) Tirvengadam. The latter genus is described to accomodate J. D. HOOKER's section *Ceriscoides* of *Gardenia*.

They are characterized by their many (rarely few)-seeded, fleshy, baccate, usually indehiscent fruits. The seeds at maturity are embedded in a gelatinous matrix (resinous or waxy in mature fruits in some genera). The ovary is 1-celled with 2-9 parietal placentas or 2-celled with the placentas attached to the septum. The ovules are immersed in pulp of apparent placental origin (placental outgrowths, according to PERIASAMY & PARAMESWARAN, 1962; CORNER, 1970). The inflorescences are morphologically terminal, but often because of sympodial growth they appear to occupy different positions on the shoots (see note on shoot-succession below). Cymes many of few-flowered, sometimes flowers solitary. The flowers are bisexual or unisexual, dioecious or polygamous. In dioecious flowers, the staminate flowers are usually crowded together while the pistillate ones are solitary. The corolla lobes are always contorted in the bud. The pollen grains are porate or colporate, sometimes in permanent tetrads. The endosperm is firm to hard-fleshy (ruminate in *Aidia*); embryo spatulate. The tribe is characterized by a great diversity of branch-systems, and testa ornamentations (see note on seed morphology, plates I-II).

SHOOT-SUCCESSION

A great diversity of branch-systems exists in the Rubiaceae. FAGERLIND's studies (1943) on the shoot-sequence in a number of species of *Randia* (sensu lato) showed that the branching systems afford important systematic characters in the revision and splitting of that heterogeneous genus. Observations of some living specimens both in the field and in the Peradeniya Botanical Garden in Sri Lanka compared with the results obtained by FAGERLIND branching experiments permit certain conclusions with regard to the delimitation of the Ceylonese genera of the Gardenieae.

As in many rubiaceous plants, the main axis is orthotropic and the lateral axes plagiotropic. Since the orthotropic or typically formed long shoot has decussate leaves, the lateral shoots often have strictly symmetrical arrangement so that they are opposite each other in a decussate arrangement. This is much evidenced in *Ceriscoides*, *Catunaregam* and in "*Xeromphis*" *malabarica* (Lam.) Raju, particularly in the young plants or in younger parts of older plants. In the Ceylonese *Gardenia*, the orthotropic axis at the base often has the leaves arranged in three's (due to suppression of one member) so that the plagiotropic axes in that region are ternate, but branches divaricately in the upper region.

The presence of buds with different morphological potentials in serial sequence or collaterally arranged on the leading shoots is a characteristic feature of *Catunaregam*, a segregate of *Randia*. The latter genus (sensu stricto) does not have leaders with serial formation of buds. Serial buds are also absent in *Aidia*, *Byrsophyllum*, *Ceriscoides*, *Gardenia* and in the following uncertain Ceylonese species : "*Randia*" *rugulosa* (Thw.) Hook. f., "*Xeromphis uliginosa*" (Retz.) Maheshwari and "*Xeromphis malabarica*" (Lam.) Raju.

The serial and the axillary buds producing the lateral shoot systems seem to be arranged according to fixed, often symmetrical systems. For example, in *Catunaregam*, the primary buds always form thorns and the secondary (dormant or proleptic) buds form flowering short shoots "spurs" or secondary long shoots. The axillary buds of *Ceriscoides* on the other hand develop into either the lateral shoots, short abortive branchlets ending in a spine or simply into stout spines. Both are modified vegetative branches which may produce a short flowering axis bearing the inflorescence or solitary flower.

The flower-bearing shoots too show interesting patterns or organisation. In *Catunaregam*, as mentioned above, the flowers arise from lateral "spurs" only. In *Ceriscoides*, they are borne on extremely short stout branchlets arising from the axils of the leaves at the tip of the lateral shoots, but sometimes they become displaced by the development of a thorn at the apex and thus occupy a subterminal or pseudo-axillary position. The inflorescence which is morphologically terminal can also attain different positions depending on the mode of branching. Thus in *Aidia* and *Gardenia*, the inflorescences which are terminal at inception can occupy a pseudo-axillary or pseudo-extra-axillary or pseudo-leaf-opposed position, because of sympodial growth. The lateral buds in the Ceylonese *Aidia* always develop at alternate nodes in the axil of a reduced leaf which fall off early and are always on the same side of the shoot. Hence the inflorescence is always unilateral. A peculiarity of this tribe is the various degree of anisophylly observed. There is a tendency

towards total suppression or reduction of some of the leaves particularly on the flower-bearing axes. *Byrsophyllum*, from the herbarium material examined, appears to be the only Ceylonese genus of this group with distinctly terminal inflorescences.

SEED MORPHOLOGY

Relatively little attention has been paid to the structure of the seed in relation to the taxonomic system of this tribe although seed characters are generally regarded as fairly conservative. The general seed coat structure of the Gardenieae agrees with that reported for the other Rubiaceae (PERIASAMY and PARAMESWARAN, 1962; CORNER, 1976). The epidermis of the ovule alone constitutes the mature seed coat due to the enlargement of the endosperm. In the genera surveyed here, the seeds are either large, small or minute, round, oblong ovoid, angular or lenticular, sometimes compressed or flattened, albuminous and covered by placental outgrowths. They are generally not ruminant except in *Aidia* and two dubious species "*Randia rugulosa*" and "*Xeromphis malabarica*" (see discussion under doubtful or uncertain species at the end of this paper).

SEED COAT STRUCTURE

I have examined under a light microscope the testa cells of several Old world species of the Gardenieae. For comparison, two New World species have also been investigated. This study has revealed an interesting feature as regards the surface of the seed, in particular the patterns or sculptures found on the seed coat surface. The testa surface is often sculpted or covered with ornamentations. *Byrsophyllum* appears to be the only Asiatic genus in which the surface of testa cells is devoid of sculptures. The variation of the sculptures in accepted genera of both the Old and New World tropics seems impressive and the uniformity among related species is very striking.

Variable terminology (BREMELAMP, 1952; VERDCOURT, 1958) has been used to describe the seed coat patterns of several rubiaceous species as no comprehensive studies of the seeds of the Rubiaceae have appeared to date. Hence, at this stage it is not possible to discuss in details this character and to decide whether the ornamentations are "pits" (foveate) or "protuberances" (areolate). Further SEM studies are required to discern the exact nature of this feature. However, since this particular aspect of the seed seems to provide interesting evidence for generic relationships and calls into doubt the taxonomic disposition of certain species, I am including details of all specimens examined (table I) and photomicrographs (plates I-II) clearly showing the variation of the testa structure in several genera and similarity between related species.

MATERIAL AND METHODS

Mature dry seeds from fairly recent material were boiled in water to rehydrate them, before stripping off the testa. For specimens in which the testa did not come off easily,

the seeds were soaked in a 10 % solution of Na OH, and heated till the whole seed coat get detached. This method proved quite effective as it also helps to get rid of the placental outgrowths which cover and often stick to the seed coat. After washing in water a piece of the testa was immersed in lactophenol then mounted. When characters proved very difficult to see because of the dark brown or blackish colour of the testa cells, the material was simply treated in sodium hypochlorite (eau de Javel), washed thoroughly to get rid of traces of the bleaching agent and then mounted in glycerine jelly. Photomicrographs were taken with a Leitz Orthoplan Photomicroscope at magnifications up to 250.

TABLE I. — Taxa with seeds specimens studied.

SPECIES	ORIGIN	REFERENCES	PLATE, FIG.
<i>Aidia cochinchinensis</i> Lour.	Indochina, Vietnam	<i>Poilane 3772</i> (P)	II, 3
<i>Aidia gardneri</i> (Thw.) Tirvengadum	Sri Lanka, Ratnapura	<i>NBK 916</i> (US)	II, 4
<i>Basanacantha spinosa</i> L.	Brazil, Rio de Janeiro	<i>Riedel 648</i> (P)	I, 2
<i>Byrsophyllum ellipticum</i> (Thw.) Hook. f.	Sri Lanka, Hiniduma	<i>Thwaites CP 3842</i> (P)	I, 7
<i>Catunaregam nilotica</i> (Stapf) Tirvengadum	Cameroon, WNW Yagou	<i>J. & A. Raynal 12184</i> (P)	I, 4
<i>Catunaregam spinosa</i> (Thunb.) Tirvengadum	Sri Lanka, Badulla	<i>Tirvengadum 450</i> (US)	I, 3
<i>Catunaregam tomentosa</i> (Bl. ex DC.) Tirvengadum	Indochina, Vietnam	<i>Chevalier 39.647</i> (P)	I, 5
<i>Ceriscoides turgida</i> (Roxb.) Tirvengadum	Sri Lanka, Badulla	<i>Jayasuriya 381</i> (US)	I, 6
“ <i>Gardenia coronaria</i> ” sensu Trimen	Sri Lanka, Batticaloa	<i>Tirvengadum 462</i> (US)	II, 1
“ <i>Gardenia latifolia</i> ” sensu Trimen	Sri Lanka	<i>Walker 1505</i> (E)	II, 2
<i>Oxyceros horrida</i> Lour.	Indochina, Vietnam	<i>D. Bois 291</i> (P)	II, 7
<i>Randia aculeata</i> L.	Guadeloupe, Basse-Terre	<i>C. & F. Sastre 5248</i> (P)	I, 1
“ <i>Randia</i> ” <i>rugulosa</i> (Thw.) Hook. f.	Sri Lanka	<i>Thwaites CP 245</i> (P)	II, 8
“ <i>Randia</i> ” <i>rugulosa</i> (Thw.) Hook. f.	South India	<i>Matthew 3150</i> (RHT)	II, 5
“ <i>Xeromphis</i> ” <i>malabarica</i> (Lam.) Raju	Sri Lanka	<i>Thwaites 1234</i> (P)	II, 6
“ <i>Xeromphis</i> ” <i>uliginosa</i> (Retz.) Maheshwari	Indochina, Laos	<i>Poilane 28040</i> (P)	I, 8

POLLEN MORPHOLOGY

The pollen grains of a number of species of Rubiaceae have been discussed by FAGERLIND (1948), BREMEKAMP (1952) and ERDTMAN (1966). KEAY (1958) and VERDCOURT (1958) in their respective studies made reference to characters of the pollen grains which

can be observed with an ordinary microscope without special knowledge of pollen morphology.

The latter concluded that pollen grain characters were not suitable as the main character for subdividing the family.

Pollen morphology, however, does support the segregation of a few genera like *Rosenbergiodendron*, *Catunaregam* (= *Xeromphis*), *Massularia*, etc. from the genus *Randia* (sensu lato) and confirms the distinctiveness of *Gardenia*. Attempts to relate pollen morphology to the taxonomy of *Randia* and the Gardenieae have also been made by SHARMA (1968) and MITRA (1969). Unfortunately, the conclusions arrived at by these authors are not satisfactory since their investigations were based on the out-dated circumscription given to genus *Randia* and tribe Gardenieae by J. D. HOOKER (1873, 1880). More recently, Mrs. KEDDAM of the Laboratoire de Phanérogamie initiated work on the pollen analysis of the African species of Gardenieae. Dr. LOBBREAU-CALLEN, palynologist at the Paris Museum, is currently investigating this group for the Asiatic species. A joint paper on the comparative pollen morphology and systematic of the group will be published after the completion of systematic revision of the whole tribe for tropical Asia based upon the data derived from other disciplines, mainly gross morphology.

As a generic character, pollen grains can be of some assistance, but its value as a specific character in this particular tribe appears to be very limited. On the basis of the aperture, two groups of genera can be distinguished in Ceylon : *Byrsophyllum*, *Aidia* and *Catunaregam* with porate pollen grains ; *Ceriscoides* and *Gardenia* with colporate pollen grains. The latter is the only Asiatic genus having pollen in permanent tetrads.

CYTOLOGY

Cytological investigations carried out on *Catunaregam spinosa* (Thunb.) Tirvengadam (as *Randia dumetorum* Lam.), *Gardenia augusta* (L.) Merr. (as *Gardenia florida* L. and as *Gardenia jasminoides* Ellis) by F. FAGERLIND (1937) and DERAMUS, THOMAS and WALKER (1964) respectively and chromosome counts made on several other species of Gardenieae by other workers reveal a base number of 22.

WOOD ANATOMY

The structure of the wood of a few rubiaceous tribes has recently been studied by KOEK-NOORMAN (1969, 1972). Her (KOEK-NOORMAN, 1972) investigation of several genera including *Gardenia* and *Randia* (sensu lato) of tribe Gardenieae as conceived by BREMEKAMP (1943, 1966), VERDCOURT (1958) and maintained here, reveals such a high degree of homogeneity in the wood anatomy of that tribe that "it seems impossible to indicate limit between the genera". Previous studies of the closely related tribe Ixoreae (KOEK-NOORMAN, 1969) has shown the unsuitability of the wood structure as a distinguishing character even at tribal level. Much earlier, JANSONNIUS (1926) came to a similar conclusion when he stated that "a classification based solely upon anatomical characters can deviate considerably from one which takes into account other systematic features".

Wood anatomy, therefore, is not a valuable taxonomic character for the circumscription of this and the neighbouring tribe Ixoreae.

TAXONOMY

DESCRIPTIVE KEY TO GENERA

1. Ovary 1-celled. Placentas 2-6, parietal. Endosperm of seeds not ruminant. Pollen grains porate or colporate.
 2. Stipules tubular, conspicuous; stipular sheaths often become free by a circumscissile cleft just above the petiole and remain on the branchlet encircling an internode. Buds resinous. Flowering shoots not thorny. Flowers bisexual, usually solitary. Anthers exserted. Pollen grains in tetrahedral tetrads, 3-porate. Fruit generally splitting open. Seeds fairly large, round or ovoid, compressed; testa surface foveate (?), areolate (?). Unarmed shrubs *Gardenia*
 - 2'. Stipules triangular, not conspicuous, slightly connate, cuspidate, deciduous. Buds not resinous. Flowering shoots sometimes ending in a rigid thorn. Flowers unisexual, dioecious or polygamo-monoecious; pistillate ones solitary, staminate ones fasciculate. Anthers inserted. Pollen grains single, 3-colporate. Fruit indehiscent. Seeds small or minute, lenticular; testa cells not as above, ornamentation quite peculiar. Armed treelets. *Ceriscoides*
- 1'. Ovary 2-celled. Placentas 2, attached to the septum of the ovary. Seeds ruminant or not ruminant. Pollen grains porate.
 3. Flowers unisexual, dioecious. Corolla tube much exceeding the lobes. Pollen grains 5-7-8-porate. Seeds about 10, oblong, flattened, imbricate; testa cells large; walls undulating; surface without ornamentation. Leaves leathery (black in dried herbarium specimens). Domatia absent. Stipules large, coriaceous, oblong, acute, convolute..... *Byrsophyllum*
 - 3'. Flowers bisexual. Corolla tube slightly longer or as long as the lobes; sometimes shorter. Pollen grains 3-porate (occasionally 2-4-porate). Seeds 8-12 or numerous, ovoid, slightly flattened or angular, not imbricate; testa cells relatively smaller; walls straight; testa surface sculpted. Leaves coriaceous or membranous (brownish or grey in herbarium specimens). Domatia sometimes present. Stipules small, membranous, triangular, acuminate, not convolute.
4. Large shrubs, often with straggling horizontal branches. Leading shoots with serial or collateral buds. Flowers few or solitary arising from lateral "spurs". Calyx lobes foliaceous. Fruit up to 4 cm in diam., crowned by the persistent calyx. Pericarp thick. Seeds ovoid, slightly flattened; endosperm not ruminant. Branches armed paired or unpaired spines..... *Catunaregam*
- 4'. Erect shrubs or small trees. Leading shoots without serial or collateral buds. Flowers numerous, terminal but becoming pseudo-axillary or pseudo-leaf-opposed because of sympodial growth, always appearing laterally above alternate nodes on flowering shoots. Calyx lobes not foliaceous. Fruit up to 4 cm in diam., tipped by the circular scar of the calyx limb. Pericarp thin. Seeds angular; endosperm ruminant. Unarmed..... *Aidia*

NOTE : In the synopsis which follows, an attempt is made to account for all validly published species names, either originally described in or transferred to the genera accepted here.

For the purposes of this paper, I am restricting the synonymy to the basionym and synonyms essential to the understanding of the generic arrangement presented.

AIDIA
(Pl. II, fig. 3-4)

- Aidia* Lour., Fl. Cochinch. : 143, 1790. — Type species : *Aidia cochinchinensis* Lour.
Stylocoryna Cav., Icon., Deser. Pl. Hispn., **4** : 45, 1797. — Type species : *Stylocoryna racemosa*, Cav.
Gynopachys Bl., Cat. Gew. Buitenz. : 48, 1823 ; *Bijdr. Fl. Nederl. Ind.*, **4** : 934, 1826, pro parte, excl. *Gynopachys corymbosa* Bl. (= *Anomanthodia auriculata* Hook. f.). — Lectotype species : *Gynopachys acuminata* Bl. (= “*Randia*” *boerlagei* Koord. & Val.).
Griffithia auct. non Wight & Arn. : THWAITES, Enum. Pl. Zeyl. : 158, 1859, pro parte, excl. *Griffithia fragrans* W. & A. and *Griffithia rugulosa* W. & A.
Randia Houst. ex L. Sect. *Gynopachys* Hook. f. in BENTH. & HOOK. f., Gen. Pl., **2** : 88, 1873, pro parte, excl. *Randia leucocarpa* Champ., *Randia coffeoides* A. Gray, *Randia acuminata* (G. Don) Benth. (= *Massularia acuminata* (G. Don) Bullock ex Doyle).
Randia auct. non Houst. ex L. : TRIMEN, *Handbk. Fl. Ceyl.*, **3** : 329, 1894, quoad *Randia gardneri* (Thw.) Hook. f.

DISTRIBUTION : Several species in the Old World tropics. One endemic species in Ceylon.

***Aidia gardneri* (Thw.) Tirvengadum, comb. nov.**
(Pl. II, fig. 3-4)

- Griffithia gardneri* Thw., Enum. Pl. Zeyl. : 158, 1859. — *Randia gardneri* (Thw.) Hook. f., in BENTH. & HOOK. f., Gen. Pl., **2** : 88, 1873 ; Fl. Brit. Ind., **3** : 112, 1880 ; TRIMEN, *Handbk. Fl. Ceyl.*, **2** : 331, 1894 ; ABEYWICKRAMA, *Ceylon J. Sci.*, **2** (2) : 230, 1959. GUNAWARDENA, Gen. et Spec. Pl. Zeyl. : 100, 1966. — Type : Ceylon, Thwaites CP 657 (holo-, K! ; iso-, A! BM! CAL! MH! P! PDA! US!).
Randia laurifolia (Arn.) Hook. f., Gen. Pl., **2** : 88, 1873. — Type : Ceylon, Walker s.n. (holo-, K! ; iso-, P!).

NOTE : The close relationship of this taxon to *Randia densiflora* (= *Aidia cochinchinensis* Lour.) had been commented on by both J. D. HOOKER and TRIMEN. It differs from the latter in the dimensions of the flowers and fruits, in leaf and fruit shape and particularly in the structure of the testa.

DISTRIBUTION : Locally common in various localities in the following Provinces in Ceylon : Sataragamuwa, Southern, Uva and North Western. Rather rare in the Central and Western Provinces.

BYRSOPHYLLUM

- Byrsophyllum* Hook. f., in BENTH. & HOOK. f., Gen. Pl. **2** : 83, 1873 ; Fl. Brit. Ind., **3** : 107, 1880 ; TRIMEN, *Handbk. Fl. Ceyl.*, **2** : 328, 1894 ; GUNAWARDENA, Gen. et Spec. Pl. Zeyl. : 100, 1959. — Lectotype species : *Byrsophyllum ellipticum* (Thw.) Hook. f.

Byrsophyllum ellipticum is here designated as lectotype because more essential details are given by J. D. HOOKER about this species.

DISTRIBUTION : Only two species are known, one endemic to Ceylon ; one endemic to South India.

***Byrsophyllum ellipticum* (Thw.) Hook. f.**
(Pl. I, fig. 7)

Coffea ? *elliptica* Thw., Enum. Pl. Zeyl. : 154, 1864. — *Stylocoryna elliptica* (Thw.) Thw., l.c. : 421. — *Byrsophyllum ellipticum* (Thw.) Hook. f., in BENTH. & HOOK. f., Gen. Pl., **2** : 83, 1873 ; Fl. Brit. Ind., **3** : 107, 1880 ; TRIMEN, *Handbk. Fl. Ceyl.*, **2** : 331, 1894 ; ABEYWICKRAMA, *Ceylon J. Sci.*, **2** (2) : 230, 1959 ; GUNAWARDENA, Gen. et Spec. Pl. Zeyl. : 100, 1966. — Type : Ceylon, *Thwaites* 3482 (BM! CAL! PDA! MH!).

NOTE : TRIMEN, who did not meet with this plant, based his diagnosis on a few specimens (*C.P.* 3482) preserved at the Ceylon National Herbarium, Peradeniya. Apart from those specimens collected by THWAITES (1864) at “ Kottawa ” and Hiniduma in the Galle District, Southern Province, I have seen two good specimens collected by WORTHINGTON from Kottawa (Nº 2351, 1946) and “ Naburukemda ” Forest, Akuressa (Nº 2578, 1947), both preserved in the Kew Herbarium.

Sterile material of this species has recently (1977) been collected during an ecological survey by Dr. and Mrs. GUNATILLEKE in the Sinharaja Forest (International Biological Programme Area) at Weddagala.

DISTRIBUTION : Southern Province, Sinharaja. Locally common.

CATUNAREGAM
(Pl. I, fig. 3-5)

Catunaregam Wolf, Gen. Pl. Vocab. Char. Def. : 75, 1776. — Type species : *Catunaregam spinosa* (Thunb.) Tirvengadam.

Katou-Naregam Rheede, Hort. Malab., **4** : 19, t. 13, 1683. (Catu-Naregam in Fig.)

Catu Naregam Adanson, Fam. Pl., **2** : 85, 534, 1763, nom. inval.

Ceriscus Gaertn., Fruct., **1** : 140, t. 28, 1788, nomen in syn. — Type species : *Ceriscus malabaricus* Gaertn., reduced in text to *Gardenia dumetorum* Retz.

Xeromphis Raf., Sylva Tellur. : 21, 1838. — Type species : *Xeromphis retzii* Raf. (= *Gardenia dumetorum* Retz.).

Lachnosiphonium Hochst., Flora, **25** : 236, 1842. — Type species : *Lachnosiphonium obovatum* Hochst.

Randia Houst. ex L. sect. *Ceriscus* Hook. f., in BENTH. & HOOK. f., Gen. Pl., **2** : 88, 1873 ; Fl. Brit. Ind., **3** : 109, 1880, pro parte, excl. *Randia uliginosa* (Retz.) DC., *Randia krausii* Harv., *Randia rudis* E. Mey., *Randia parvifolia* Harv.

Randia auct. non Houst. ex L. : TRIMEN, *Handbk. Fl. Ceyl.*, **3** : 329, 1894, quoad *Randia dumetorum* (Retz.) Poir.

DISTRIBUTION : Two species in tropical Asia ; possibly two species in East, Central and South Africa and two species in Madagascar.

Catunaregam spinosa (Thunb.) Tirvengadam
(Pl. I, fig. 3)

Gardenia spinosa Thunb., Diss. Gard., 7 : 16, Pl. 2, f. 4, 1780 ; *Randia spinosa* (Thunb.) Bl., Bijdr. : 981, 1826 ; *Xeromphis spinosa* (Thunb.) Keay, Bull. Jard. bot. Etat Brux., 28 : 37-38, 1958.

— Type : Macao, J. B. Bladh (BM!).

Gardenia spinosa L. f., Suppl. Pl. : 164, 1781. — Type : Madras, König s.n. (BM!).

Gardenia dumetorum Retz., Obs., 2 : 14, 1781 ; *Randia dumetorum* (Retz.) Poir., in LAM., Encycl. Méth., Bot., Suppl. 2 : 829, 1811 ; MOON, Cat. Pl. Ceyl. : 19, 1824 ; TRIMEN, Handbk., Fl. Ceyl., 2 : 330, 1894 ; ABEYWICKRAMA, Ceylon J. Sci., 2 (2) : 230, 1959 ; GUNAWARDENA, Gen. et Spec. Pl. Zeyl. : 100, 1966 ; *Ceriscus malabaricus* Gaertn., Fruct., 1 : 140 : t. 28, 1788, nom. illeg. — Type : Madras, König s.n. (BM!).

NOTE : A wide range of variation is manifest in the extra-Ceylonese specimens seen. Possibly a few ecological forms will have to be distinguished.

DISTRIBUTION : Very common in the dry zone, particularly in the coastal areas. Widespread in tropical Asia, it also occurs in East, Central and possibly in South Africa.

CERISCOIDES
(Pl. I, fig. 6)

Ceriscoides (Hook. f.) Tirvengadam, gen. et stat. nov.

Gardenia sect. *Ceriscoides* Hook. f., in BENTH. & HOOK. f., Gen. Pl., 2 : 90, 1873.

Gardenia sect. *Ceriscus* Hook. f., Fl. Brit. Ind., 3 : 118, 1880.

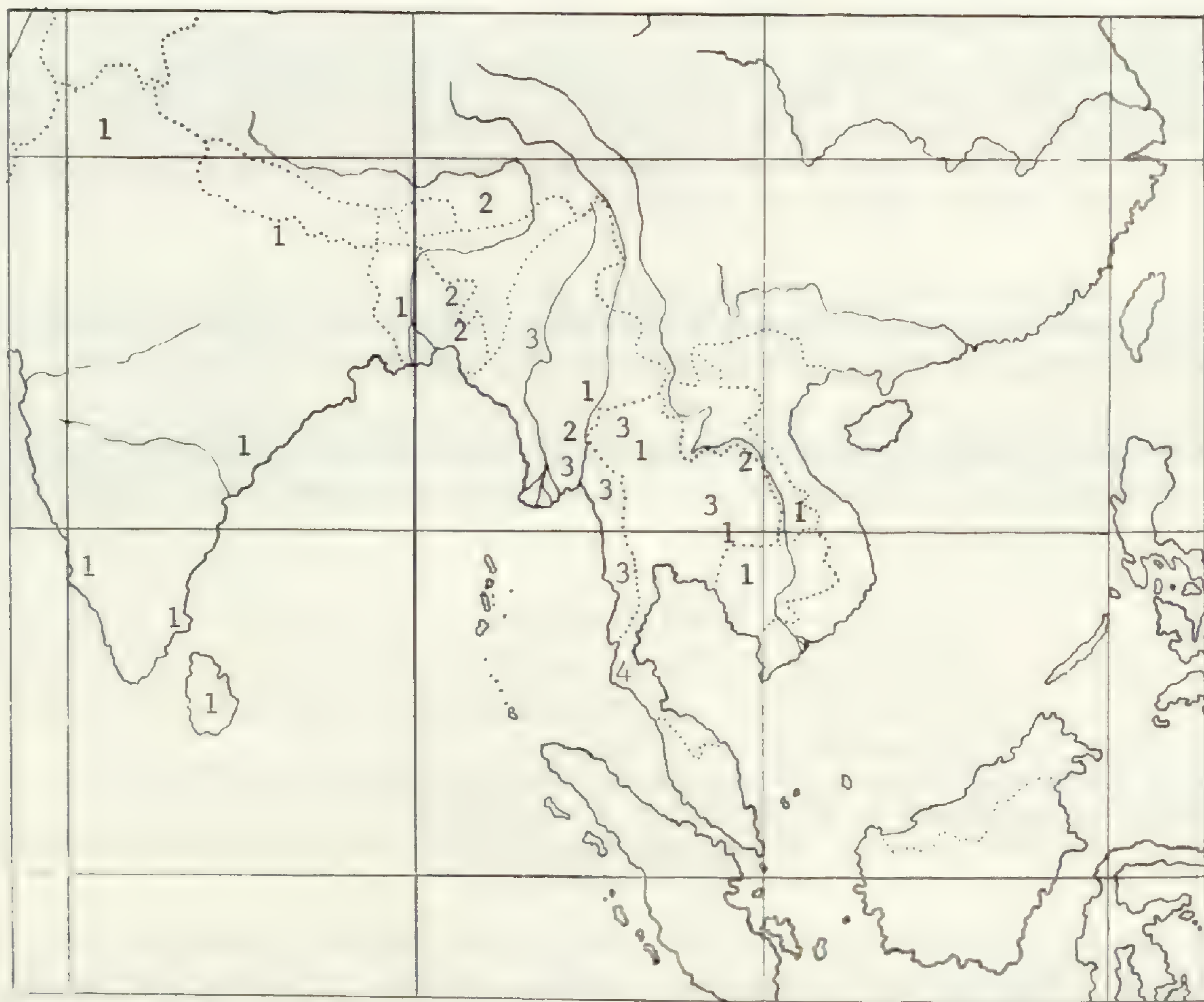
Gardenia auct. non Ellis : TRIMEN, Handbk. Fl. Ceyl., 2 : 334, 1894, quoad *Gardenia turgida* Roxb.

Small trees. Young branches armed with paired thorns ; sometimes lateral shoots end in a thorn. Stipules small, triangular, slightly connate cuspidate, deciduous. Leaves opposite or fasciculate at the tip of lateral branches or on short stout flowering shoots. Domatia present. Flowers borne at the end of short lateral branchlets (sometimes they become displaced by the development of a thorn at the apex of the shoot and occupy a subterminal or pseudo-axillary position), usually 5-merous, dimorphic, dioecious or polygamo-monoecious. Staminate flowers fasciculate, pistillate ones solitary. Calyx lobes foliaceous or spatulate, very variable in the staminate flowers (sometimes much reduced or subtruncate or lobes unequal ; occasionally only 1 lobe develops). In the pistillate flowers, lobes larger and always foliaceous. Corolla white or greenish white, fading yellow, fragrant. Corolla tube cylindrical or campanulate, longer than the calyx tube, glabrous in the throat. Stamens inserted, fusiform. Ovary 1-celled with 4-6 parietal placentas. Ovules numerous. Fruit ovoid, obovoid or subglobose, tip obtuse or mamillate, indehiscent, up to 5 cm in diam. Mature fruit topped by large circular calyx scar. Exocarp

leathery, warty or rugose outside; mesocarp thick and woody; endocarp crustaceus. Seeds numerous, embedded in a waxy pulp, lenticular, up to 2 mm in diam. Testa sculpted; ornamentation quite peculiar (cf. pl. I, fig. 6). Endosperm not ruminant.

Type species : *Ceriscoides turgida* (Roxb.) Tirvengadam.

DISTRIBUTION : Four species confined to continental Asia, one of which *Ceriscoides turgida* also in Ceylon. Possibly two distinct species in Java and the Philippines respectively.



MAP 1. — Geographical distribution of *Ceriscoides* Tirvengadam, gen. et stat. nov. (Gardenieae-Rubiaceae).
1. *C. turgida* (Roxb.) Tirvengadam. — 2. *C. campanulata* (Roxb.) Tirvengadam. — 3. *C. sessiliflora* (Wall. ex Kurz) Tirvengadam. — 4. *C. mamillata* (Craib) Tirvengadam.

TAXONOMIC HISTORY AND RELATIONSHIP OF THE GENUS *Ceriscoides*

J. D. HOOKER (*in* Genera Plantarum, 2 : 90, 1873) established for genus *Gardenia*, section *Ceriscoides* to accomodate *Gardenia campanulata* Roxb. and *Gardenia turgida* Roxb. on the basis that they have the habit of “*Randia* section *Ceriscus*”. In Flora of British India (3 : 118, 1880), however, he changed the sectional name *Ceriscoides* to *Ceriscus* while maintaining the latter name for a section he had earlier described for *Randia*. KEAY

(1958) raised *Randia* Houst. ex L. sect. *Ceriscus* Hook. f. to generic level under *Xeromphis* Raf. I have earlier in this paper placed the latter in synonymy under *Catunaregam* Wolf.

The distinctness of the group of plants which J. D. HOOKER placed in section *Ceriscoides* of *Gardenia*, however, has never been questioned since HOOKER and all subsequent authors separated *Gardenia* from *Randia*, solely on the basis of the structure of the ovary, generally considered to be 1-celled in *Gardenia* and 2-celled in *Randia*. Although the new genus is distinctly 1-celled, it possesses a number of characters that clearly distinguish it from *Gardenia* and the previously established genera of tribe Gardenieae including *Randia* (sensu lato). The points of difference between *Gardenia* and *Ceriscoides*, the latter apparently confined to tropical Asia, are shown in table II.

“*Gardenia*” *erythroclada* Kurz which J. D. HOOKER (1880, l.c.) assigned to *Randia* sect. *Ceriscoides* certainly does not belong here. It has a very different testa and differs in a number of other features.

TABLE II.

<i>Ceriscoides</i>	<i>Gardenia</i>
Armed treelets or shrubs.	Unarmed shrubs or trees.
Stipules triangular, cuspidate not conspicuous, deciduous.	Stipules tubular, conspicuous persistent.
Leaves opposite or fasciculate.	Leaves opposites or ternate.
Buds not resinous.	Buds resinous.
Flowers small, inconspicuous, dioecious, dimorphic.	Flowers large, conspicuous (ornamental), perfect, not dimorphic.
Flowers borne on stout branchlets appearing on lateral branches sometimes ending in a thorn.	Flowers seemingly terminal but appearing laterally (pseudo-axillary) by sympodial growth.
Anthers included.	Anthers exserted.
Pollen grains single, 3-colporate.	Pollens grains in tetrahedral tetrads, 3-porate.
Fruit topped by large circular calyx scar at maturity. Exocarp leathery ; mesocarp woody ; endocarp crustaceus. Fruit indehiscent.	Fruit often crowned by persistent calyx limb at maturity. Exocarp thin ; mesocarp fibrous-coriaceous, endocarp bony, shining inside. Fruit sometimes dehiscent.
Seeds lenticular, 2 mm in diam., pale yellow. Testa surface with peculiar « double » ornamentation. (Pl. I, fig. 6.)	Seeds ovoid or round, 3-4 mm in diam., reddish brown. Test surface apparently areolate (foveolate ?). Pl. II, fig. 1-2.)

***Ceriscoides turgida* (Roxb.) Tirvengadum, comb. nov.**
(Pl. I, fig. 6 ; pl. III, fig. 1-2)

Gardenia turgida Roxb. [Hort. Beng. : 15, 1814, nom. nud.] ; Fl. Ind., ; 2 : 557, 1824 ; ed. Carey, 1 : 711, 1832 ; Hook. f., Gen. Pl., 2 : 89, 1873 ; CLARKE, *J. Linn. Soc.*, 17 : 310, 1880 ; Hook. f., Fl. Brit. Ind., 3 : 108, 1880 ; TRIMEN, in BRITTEN, *J. Bot.*, 27 : 163, 1889 ; *Handbk. Fl.*

Ceyl., **2** : 334, 1894; GANDHI, in SALDANHA & NICOLSON, Fl. Hassan Distr. Ind. : 577, 1976. — Type : represented by ROXBURGH drawing n^o 2456 (2455 in manuscript), according to SEALY (*Kew Bull.*, **2** : 342, 1956). *Wight Plate 579* (Icon. 2, 1840) is reproduced from that drawing.

Gardenia montana Roxb., Fl. Ind., **2** : 556, 1824; ed. Carey, **1** : 709, 1832. — *Gardenia turgida* var. *montana* (Roxb.) Hook. f., Fl. Brit. Ind., **3** : 108, 1880. — Type : represented by ROXBURGH drawing n^o 16. *Wight Plate 577*, l.c., is reproduced from that drawing.

NOTE : TRIMEN expressed doubt as to the correct naming of this species since he did not see the flower. Having collected it twice and after critical examination of the extra-Ceylonese material, I here confirm its identity with the taxon that ROXBURGH described as *Gardenia turgida*.

An extremely rare taxon. It has been collected twice only since TRIMEN wrote he only met with it at Nilgala, Uva, in Jan. 1888, once by JAYASURIYA (N^o 381) at Petiyagoda, Uva Province and another time by the author (*Tirvengadum 617, 618*) at the same locality.

DISTRIBUTION : Locally common in Badulla District, Uva Province. Also in India, Burma, Thailand, Indochina (Cambodia and Laos-new record).

New combinations for the following Asiatic species are given below.

Ceriscoides campanulata (Roxb.) Tirvengadum, comb. nov.
(Pl. IV, fig. 1)

Gardenia campanulata Roxb. [Hort. Beng. : 15, 1814, nom. nud.] ; Fl. Ind., l.c. : 556; Hook. f., Fl. Brit. Ind., **3** : 118, 1880. — Type : not seen (presumably lost). A ROXBURGH's specimen seen from the Paris herbarium is possibly the isotype.

NOTE : “ *Gardenia* ” *blumeana* DC. (Prodr. 4 : 383, 1830) doubtfully placed in synonymy under this species by J. D. HOOKER, l.c., is possibly a distinct species from Indonesia (Java).

DISTRIBUTION : Bangladesh, India, Burma, Thailand.

Ceriscoides sessiliflora (Wall. ex Kurz) Tirvengadum, comb. nov.
(Pl. V, fig. 1-2)

Gardenia sessiliflora Wall. ex Kurz, Pres. Rep. App. B. Pegu : 58, 1875; For. Fl. Burma, **2** : 40, 1877. — Lectotype : Ripo Attran, Wallich 8291 (Wall. — K).

DISTRIBUTION : Burma, Thailand ?.

Ceriscoides mamillata (Craib) Tirvengadum, comb. nov.
(Pl. IV, fig. 2)

Gardenia mamillata Craib, Fl. Siam. Enum., **1** (2) : 121, 1932. — Type : Ranawng, Kerr 16750 (K; BM, iso.).

DISTRIBUTION : Thailand.

NOTE : *Gardenia curranii* Merr. Sp. Blancoanae : 363, 1918 (= *Randia aculeata* Blanco, Fl. Philip. : 141, 1837, non Linn.) appears to belong to this genus. I have seen only one single fruiting specimen (Merrill Sp. Blancoanae N° 76) in the Paris collection. It is possibly a distinct Philippines species if not conspecific with the Javanese taxon *Gardenia blumeana* DC. (See note under *Ceriscoides campanulata*). Flowering material is required to confirm its placement with certainty.

GARDENIA

Gardenia Ellis, *Phil. Trans. R. Soc.*, **51** (2) : 935, t. 23, 1761, nom. cons. — Types species : *Gardenia jasminoides* Ellis.

Gardenia Ellis sect. *Eugardenia* Hook. f., in BENTH. & Hook. f., *Gen. Pl.*, **2** : 89, 1873, pro parte, excl. *Gardenia amoena* Sims ; Hook. f., *Fl. Brit. Ind.* : 115, 1880, pro parte, excl. sect. *Ceriscoides* and sect. *Rothmannia*.

DISTRIBUTION : A well circumscribed paleotropical genus represented by about 25 species in South East Asia. Several species occur in Malesia, the Pacific area, Australia, Africa and Madagascar. The double-flowered form of *Gardenia augusta* seems to be the only horticultural representative of this genus frequently and successfully cultivated outside the Old World tropics. Represented by three species in Ceylon, two of which are probably endemics.

1. *Gardenia augusta* (L.) Merr.

Gardenia augusta (L.) Merr., *Interpret. Rumph. Herb. Amboin.* : 485, 1917 ; A. C. SMITH, *Am. J. Bot.*, **61** (2) : 113, 1974. — *Varneria augusta* L., *Amoen. Acad.*, **4** : 136, 1759. — Type : based on *Catsjopiri* Rumph., *Herb. Amboin.*, **7** : 26, t. 14, f. 2, 1755.

Gardenia jasminoides Ellis, *Phil. Trans.*, **51** (2) : 935, t. 23, 1761. — Type : not seen. (Possibly at the Botanical Museum in Lund, cf. A. C. SMITH, l.c.).

Gardenia florida L., *sp. Pl. ed.*, **2** : 305, 1762. — Based on *Gardenia jasminoides* Ellis.

NOTE : I am following A. C. SMITH who accepts MERRILL's first conclusion in adopting the epithet *augusta* as the correct name for this widely cultivated ornamental species. Opinion, however, still differs as to its correct nomenclature. Bakhuizen VAN DEN BRINK (*personal communication*) believes that the correct name should be *Gardenia jasminoides*. His argument is that *Varneria augusta* is invalid (not a description generico-specifica according to Article 42 of the Code) as *Varneria* is not a "new" genus. A. C. SMITH on the other hand argues that the validity of the genus *Varneria* depends on one's interpretation of Article 41 of the International Code of Nomenclature, and that of the species on a reasonable interpretation of Article 42. In Linnaeus (*Amoen. Acad.*, **4** : 136, 1759), the

name *Varneria* is in fact preceded by the vernacular “Cathjopiri” (sic) which had been previously and adequately described and illustrated and would seem effectively published according to Article 29 of the Code.

What is actually at issue is the interpretation of “new” in this context. Dr. FOSBERG (*personal communication*) has informed me that the Special Committee on Phanerogams is at the moment considering an amendment to the Code to clear up this matter. Since this will not be voted on until the next International Botanical Congress in 1980, I am interpreting the Code in the sense of A. C. SMITH.

DISTRIBUTION : Cultivated in gardens in Ceylon. In the Galle District, Southern Province, it is often found growing among hedges. In Ratnapura, Sabaragamuwa Province, it appears to be spontaneous.

2 & 3. ***Gardenia latifolia*** sensu Trimen and ***Gardenia coronaria*** sensu Trimen
(Pl. II, fig. 3-4)

There is a taxonomic problem concerning the nomenclature and specific distinctiveness of those two beautiful species of *Gardenia*. Both THWAITES and TRIMEN seem to have confused two different Indian species, viz. *Gardenia latifolia* Soland. in Ait. and *Gardenia coronaria* Buch.-Ham. with the above taxa. J. D. HOOKER, in his treatment of the Flora of British India (1880), correctly expressed doubt and excluded both, but did not attempt to clarify the situation. The availability of herbarium material from several European herbaria, and my own recent collection together with my own field observations in Sri Lanka, have made it clear that two distinct new taxa are involved. These will be treated taxonomically in detail in a separate paper shortly to appear.

DOUBTFUL OR UNCERTAIN SPECIES

Listed below are three taxa which cannot definitely be placed in any of the genera mentioned in the key. They require further critical investigation which will be reported on later.

“***Randia***” ***rugulosa***
(Pl. II, fig. 5, 8)

Griffithia rugulosa Thw., Enum. Pl. Zeyl. : 159, 1859. — *Randia rugulosa* (Thw.) Hook. f., in BENTH. & HOOK. f., Gen. Pl., 2 : 88, 1873 ; Fl. Brit. Ind., 3 : 133, 1880, pro parte ; TRIMEN, Handbk. Fl. Ceyl., 2 : 331, 1894. — Type : Ceylon, Thwaites CP 245 (holo-, K! : iso-, BM! CAL! P! PDA!).

NOTE : The South Indian taxon “*Randia*” *speciosa* (Bedd.) Hook. f., which J. D. HOOKER, l.c., assumed to be conspecific with “*Randia*” *rugulosa* (Thw.) Hook. f., although superficially resembles the latter, differs in habit and in a number of characters including

the testa cells. J. D. HOOKER places *Randia rugulosa* in section *Gynopachys* of *Randia* (= *Aidia* Lour.). The South Indian taxon judging from the surface structure of the seed coat (pl. II, fig. 5) appears to be closer to *Aidia* than to the Ceylon taxon (pl. II, fig. 8). The Ceylon taxon, on the other hand, has a seed surface pattern which matches well *Oryceros horrida* Lour. (pl. II, fig. 7), type of genus *Oryceros*. It also has the habit of *Oryceros* but lacks spines, a characteristic feature of the latter genus. Current investigation of *Oryceros*, an ill-defined genus, may eventually help to clarify the situation.

I have not seen any recent collection of "*Randia*" *rugulosa* (Thw.) Hook. f. It has not been collected or seen in Sri Lanka since the time THWAITES noted that it was not common. It is very doubtful if it is still extant on the island.

"Xeromphis" uliginosa
(Pl. I, fig. 8)

Gardenia uliginosa Retz., Obs., **2** : 14, 1781. — *Randia uliginosa* (Retz.) Poir., in LAM., Encycl. Suppl., **2** : 829, 1812 (sphalm. *Grandia*); DC., Prodr., **4** : 386, 1830; Hook. f., in BENTH. & Hook. f., Gen. Pl., **2** : 88, 1873; Fl. Brit. Ind., **3** : 110, 1880; TRIMEN, Handbk. Fl. Ceyl., **2** : 330, 1894. — "*Xeromphis*" *uliginosa* (Retz.) MAHESHWARI, Bull. Bot. Surv. India, **3** (4) : 92, 1962. — Type : Madras (Coromandel ?), *Konig s.n.* (Lund ?).

NOTE : The transfert of *Gardenia uliginosa* Retz. to *Randia* usually credited to DE CANDOLLE (l.c.) was actually effected by POIRET (l.c.). Although DE CANDOLLE clearly expressed doubt as to its correct identity, several authors followed POIRET in placing this taxon in *Randia*. MAHESHWARI (l.c.), however, transferred it to *Xeromphis* presumably because of its classification in J. D. HOOKER's section *Ceriscus* of *Randia*, a section given generic status and placed under *Xeromphis* (= *Catunaregam* Wolf) by KEAY (1958). I have not seen the type specimen which is possibly represented by a poor specimen in Lund Herbarium according to C. E. C. FISCHER (Kew Bull. : 58, 1932). Examination of several specimens from the type locality reveals a number of features including a distinct testa surface (pl. I, fig. 8) which clearly distinguish it from *Gardenia*, *Randia sensu stricto*, *Catunaregam* and all segregates of *Randia sensu lato*.

From the few specimens seen at the Peradeniya Herbarium, it seems to have been collected a few times from Kantalai, Trincomalee District, Eastern Province and once from Bibile, Uva Province. Recent collections include *Balakrishnan* (NBR 371), from Trikonamadu, Polannaruwa District, North Central Province, *Tircengadum* 473, Habarاما/Kantalai Rd, 134/2 mile post and *Tircengadum* 772, 773, 774, all from Pollanaruwa District.

"Xeromphis" malabarica
(Pl. II, fig. 6)

Randia malabarica Lam., Encycl. Méth., **3** : 25, 1789; Hook. f., Fl. Brit. Ind., **3** : 111, 1880; TRIMEN, Handbk. Fl. Ceyl., **2** : 331, 1894. — "*Xeromphis*" *malabarica* (Lam.) Raju, Excurs. Fl. Simhachalam Hills : 13, 1966. — Type : based on "*Benkara*" Rheede (Hort. Malab., **5** : 69, t. 35, 1685).

NOTE : RAJU (l.c.) transferred *Randia malabarica* Lam., a species placed by J. D. HOOKER in section *Oxyceros* of *Randia* to *Xeromphis* Raf. (= *Catunaregam* Wolf), obviously because of the superficial resemblance of that taxon to the type species of the latter genus. It certainly does not belong to *Catunaregam* Wolf and possibly also not to *Oxyceros* Lour., a genus reinstated by YAMAZAKI (1970) to accomodate a few species of *Randia* sect. *Oxyceros*. The testa cells of « *Xeromphis* » *malabarica* (pl. II, fig. 6) seem to be more akin to those of *Aidia* (pl. II, figs. 3-4) than to those of *Oxyceros* (pl. II, fig. 7). Current investigation of the difficult genus *Oxyceros* will no doubt throw more light on this matter.

CULTIVATED SPECIES

The following species are cultivated in the Botanical Garden, Peradeniya, Kandy District, Central Province : 1. *Basanacantha spinosa* L. — 2. *Euclinia longiflora* Salisb. — 3. *Gardenia coronaria* (?) Buch.-Ham. — 4. *Gardenia latifolia* (?) Soland. in Ait. — 5. *Gardenia tahitensis* DC. — 6. *Genipa americana* L. — 7. *Oxyanthus racemosus* (Schum. & Thonn.) Keay. — 8. *Randia aculeata* L. — 9. *Randia* ? *africana* G. Don. — 10. *Rothmannia longiflora* Salisb. — 11. *Rosenbergiodendron longiflorum* (Ruiz & Pavon) F. Fagerl.

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INDEX OF SCIENTIFIC NAMES

Accepted names are in plain type, synonyms in italics and new names in bold-faced type ; dub., excl. : dubious and excluded respectively.

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 — *jasminoides* Ellis, 9, 17.
 — *latifolia* Soland. in Ait., 18, 20.
 — *latifolia sensu* Trimen, 8, 18, 26.
 — *mamillata* Craib, 16.
 — *montana* Roxb., 16.
 — *sessiliflora* Wall. ex Kurz, 16.
 — *spinosa* L. f., 13.
 — *spinosa* Thunb., 13.
 — *tahitensis* DC., 20.
 — *turgida* Roxb., 13, 14, 15.
 — *turgida* Roxb. var. *montana* (Roxb.) Hook. f., 16.
 — *uliginosa* Retz., 19.
Genipa americana L., 20.
Griffithia *auct. non W. & A.*, 11.
 — *fragrans* W. & A., 11.
 — *gardneri* Thw., 11.
 — *rugulosa* W. & A., 11.

Gynopachys Bl., 11.

— *acuminata* Bl., 11.

— *corymbosa* Bl., 11.

Himalrandia Yamazaki, 5.

“*Katou-Naregam*” Rheede, 12.

Lachnosiphonium Hochst., 12.

— *obovatum* Hochst., 12.

Massularia acuminata (G. Don) Bullock ex Doyle, 11.

Nargedia Bedd. (*excl.*), 4.

Oxyanthus racemosus (Schm. & Thonn.) Keay, 20.

Oxyceros Lour., 5, 19, 20.

— *horrida* Lour., 8, 19, 26.

Porterandia Ridl., 5.

Randia Houst. ex L., 4, 6, 9, 11, 12, 15, 19.

— *auct. non* Houst. ex L., 11, 12.

— *sect. Anisophyllea* Hook. f., 5.

— *sect. Ceriscoides* Hook. f., 15.

— *sect. Ceriscus* Hook. f., 12, 14, 15, 19.

— *sect. Eurandia* Hook. f., 5.

— *sect. Gynopachys* Hook. f., 19.

— *aculeata* Blanco, 17.

— *aculeata* L., 8, 17, 20, 24.

— *africana* G. Don (*dub.*), 20.

— *boerlagei* Koord. & Val., 11.

— *coffeoides* A. Gray (*excl.*), 11.

— *densiflora* Benth., 11.

— *dumetorum* (Retz.) Poir., 12, 13.

— *gardneri* (Thw.) Hook. f., 11.

— *krausii* Harv. (*excl.*), 12.

— *leucocarpa* Champ. (*excl.*), 11.

— *laurifolia* (Arn.) Hook. f., 11.

— *malabarica* Lam., 19, 20.

— *parvifolia* Harv. (*excl.*), 12.

— *rudis* E. Mey. (*excl.*), 12.

— *speciosa* (Bedd.) Hook. f. (*dub.*), 18.

— *rugulosa* (Thw.) Hook. f. (*dub.*), 6, 7, 8, 18, 19, 26.

— *spinosa* (Thunb.) Bl. 13.

— *uliginosa* (Retz.) DC., 12, 19.

Rondeletia asiatica L., 4.

Rosenbergiodendron F. Fagerl., 5, 9.

— *longiflorum* (Ruiz & Pavon) F. Fagerl., 20.

Rothmannia Thunb., 5.

— *longiflora* Salisb., 20.

Scyphostachys Thw. (*excl.*), 4.

Stylocoryna elliptica (Thw.) Thw., 12.

— *racemosa* Cav., 11.

Tarennia Gaertn., 4.

— *asiatica* (L.) O. Kuntze ex K. Schum., 4.

Tricalysia A. Rich. ex DC. (*excl.*), 4.

Varneria augusta L., 17.

Webera Schreb., 4.

- Xeromphis* Raf., 5, 9, 12, 15, 20.
— *malabarica* (Lam.) Raju (*dub.*), 6, 7, 8, 19, 20, 26.
— *retzii* (Raf.) Keay, 12.
— *spinosa* (Thunb.) Keay, 13.
— *uliginosa* (Retz.) Maheshwari, 6, 8, 19, 24.

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PLATE I

Light micrograph showing surface patterns of seed coat :

- FIG. 1. — *Randia aculeata* L., × 120.
- FIG. 2. — *Basanacantha spinosa* L., × 250.
- FIG. 3. — *Catunaregam spinosa* (Thunb.) Tirvengadum, × 250.
- FIG. 4. — *Catunaregam nilotica* (Stapf) Tirvengadum, × 250.
- FIG. 5. — *Catunaregam tomentosa* (Bl. ex DC.) Tirvengadum, × 250.
- FIG. 6. — *Ceriscoides turgida* (Roxb.) Tirvengadum, new combination, × 250.
- FIG. 7. — *Byrsophyllum ellipticum* (Thw.) Hook. f., × 65.
- FIG. 8. — "*Xeromphis*" *uliginosa* (Retz.) Maheshwari, × 120.

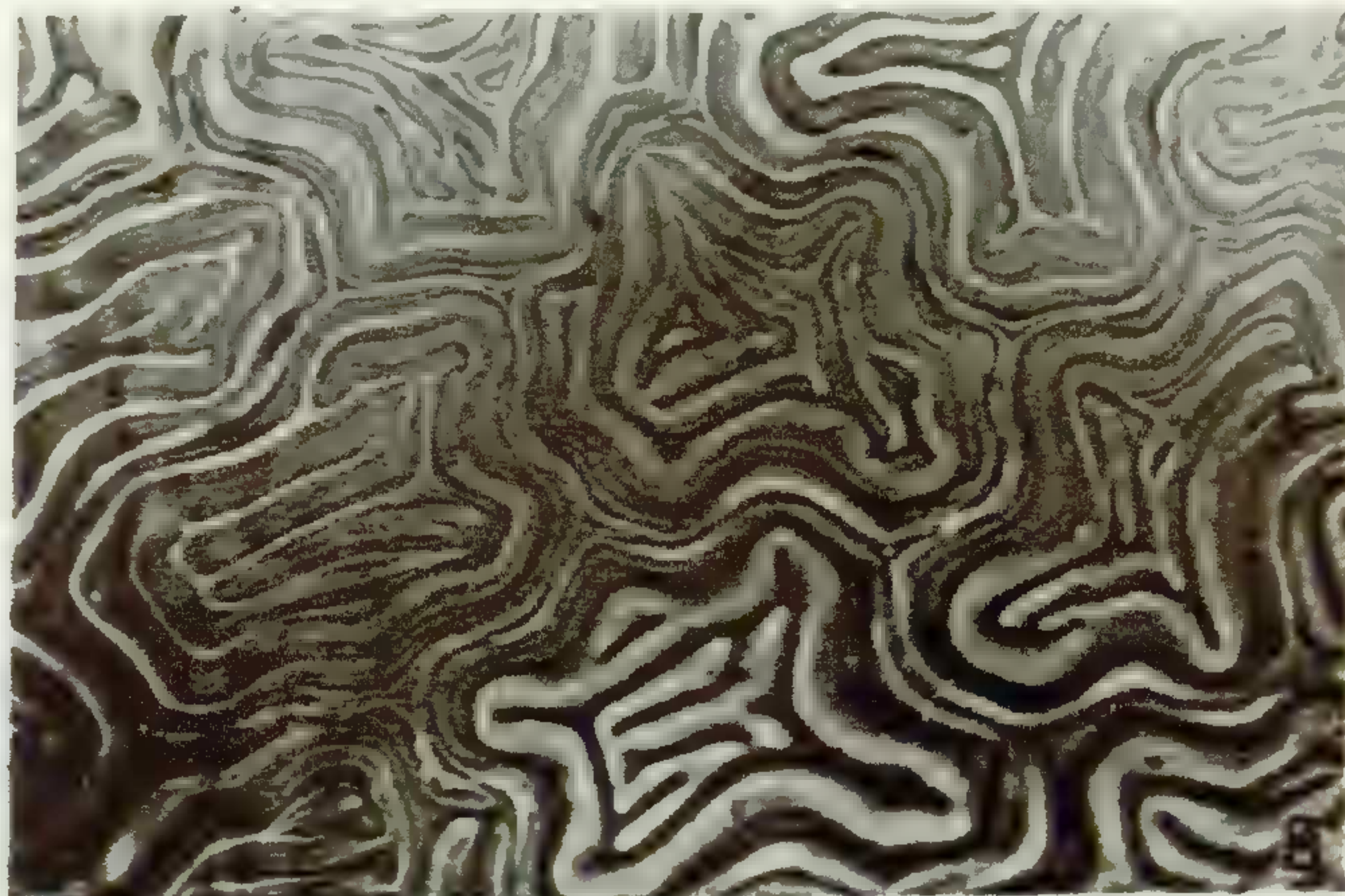
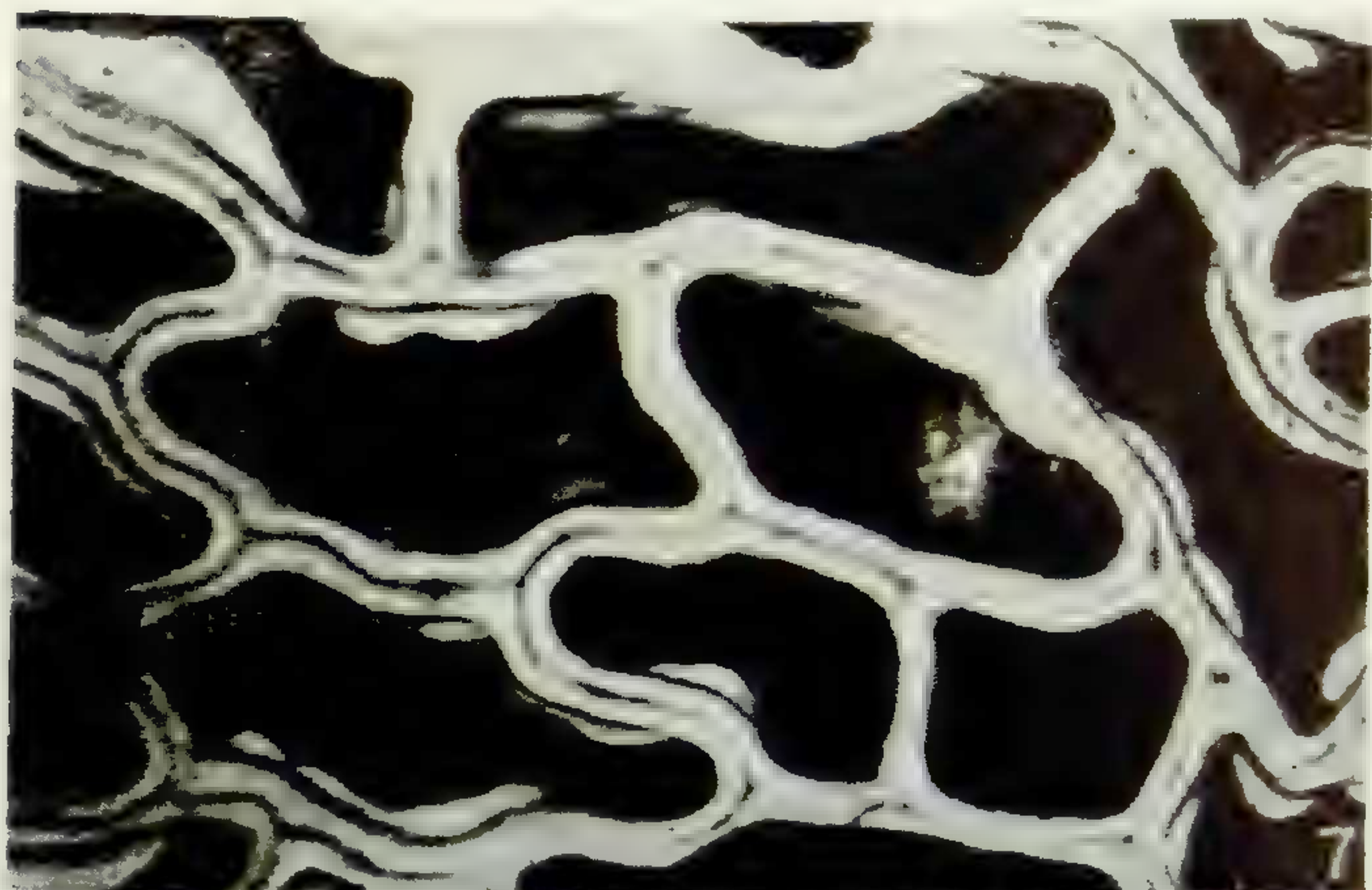
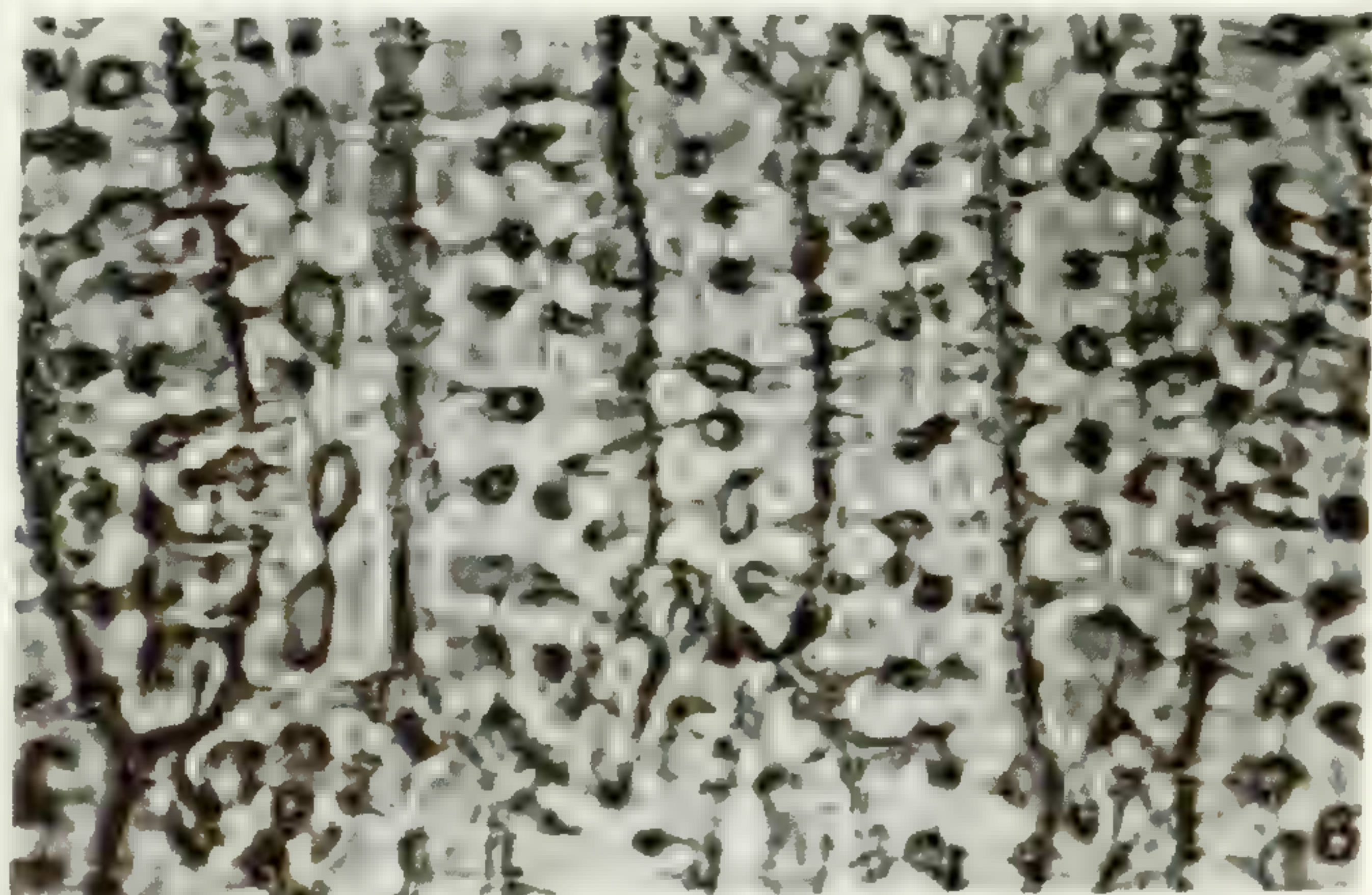
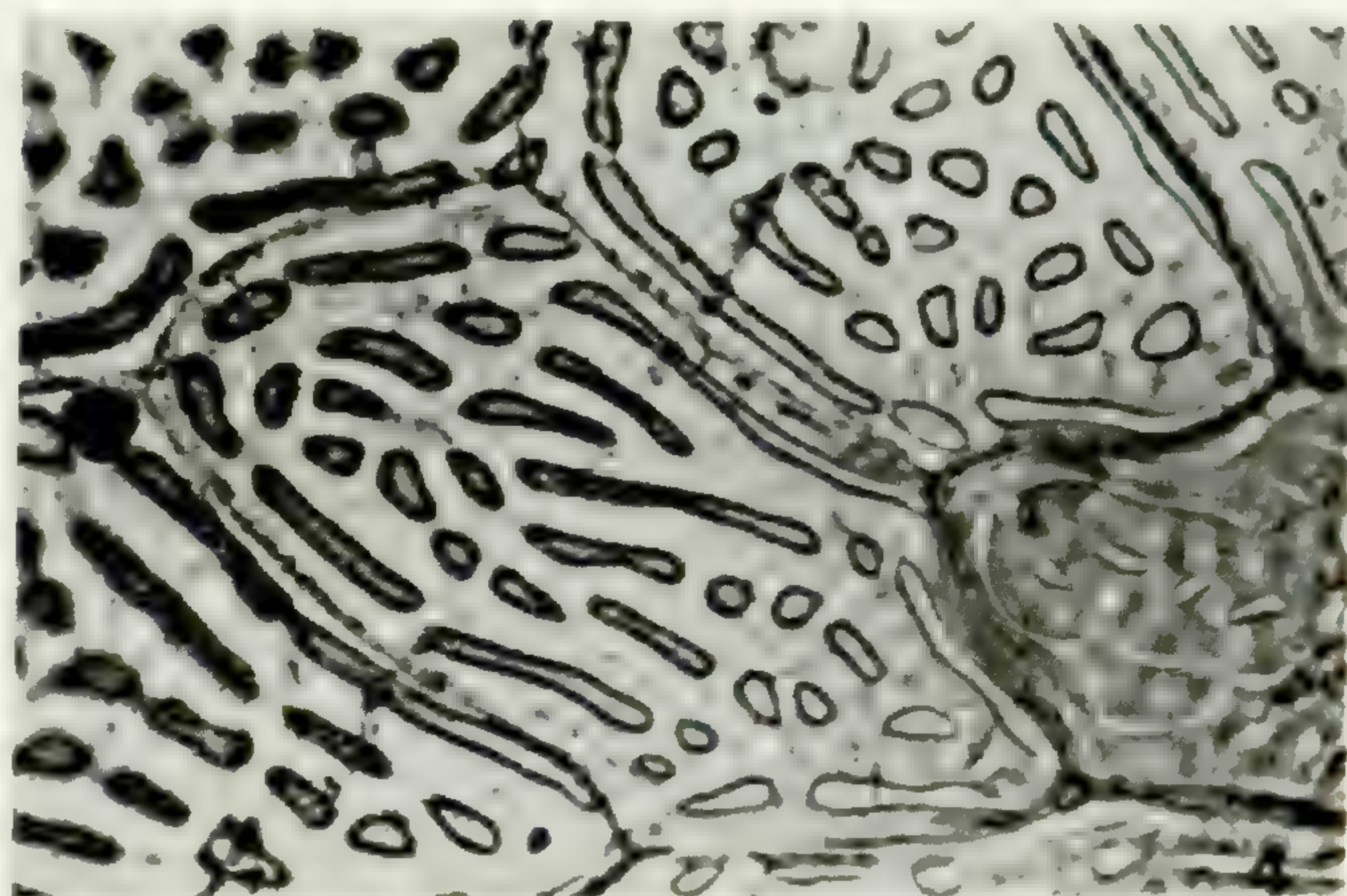
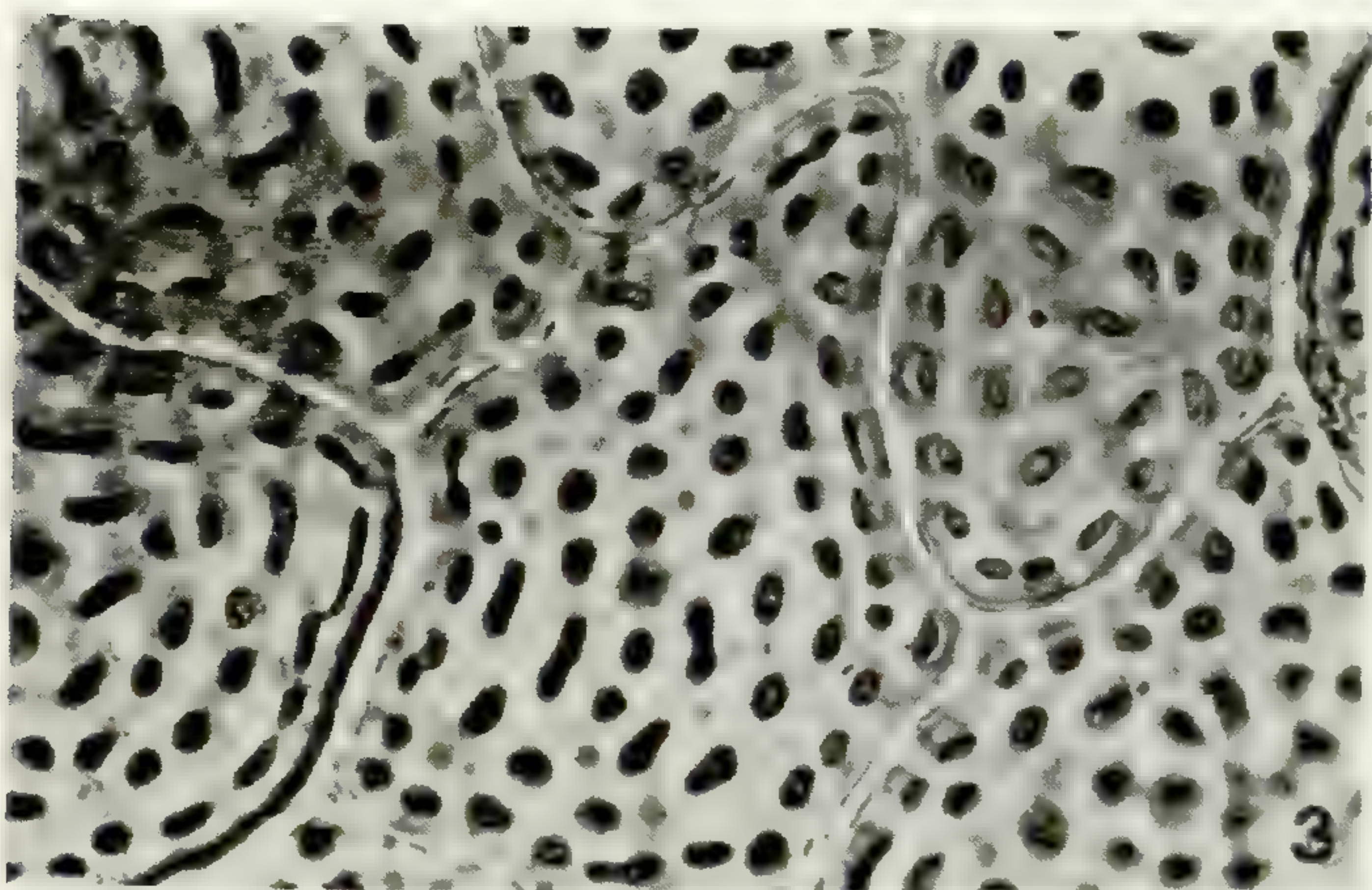
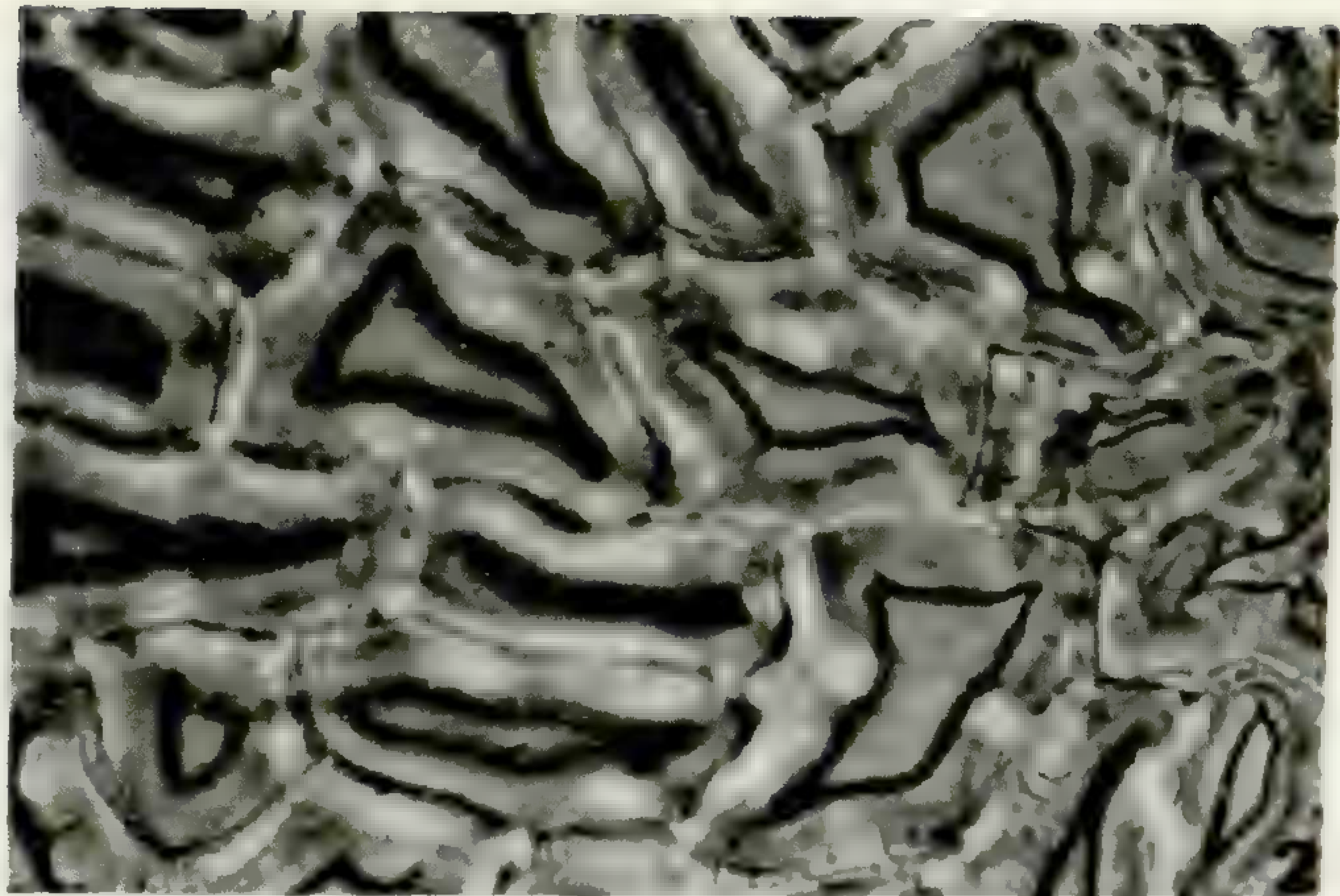
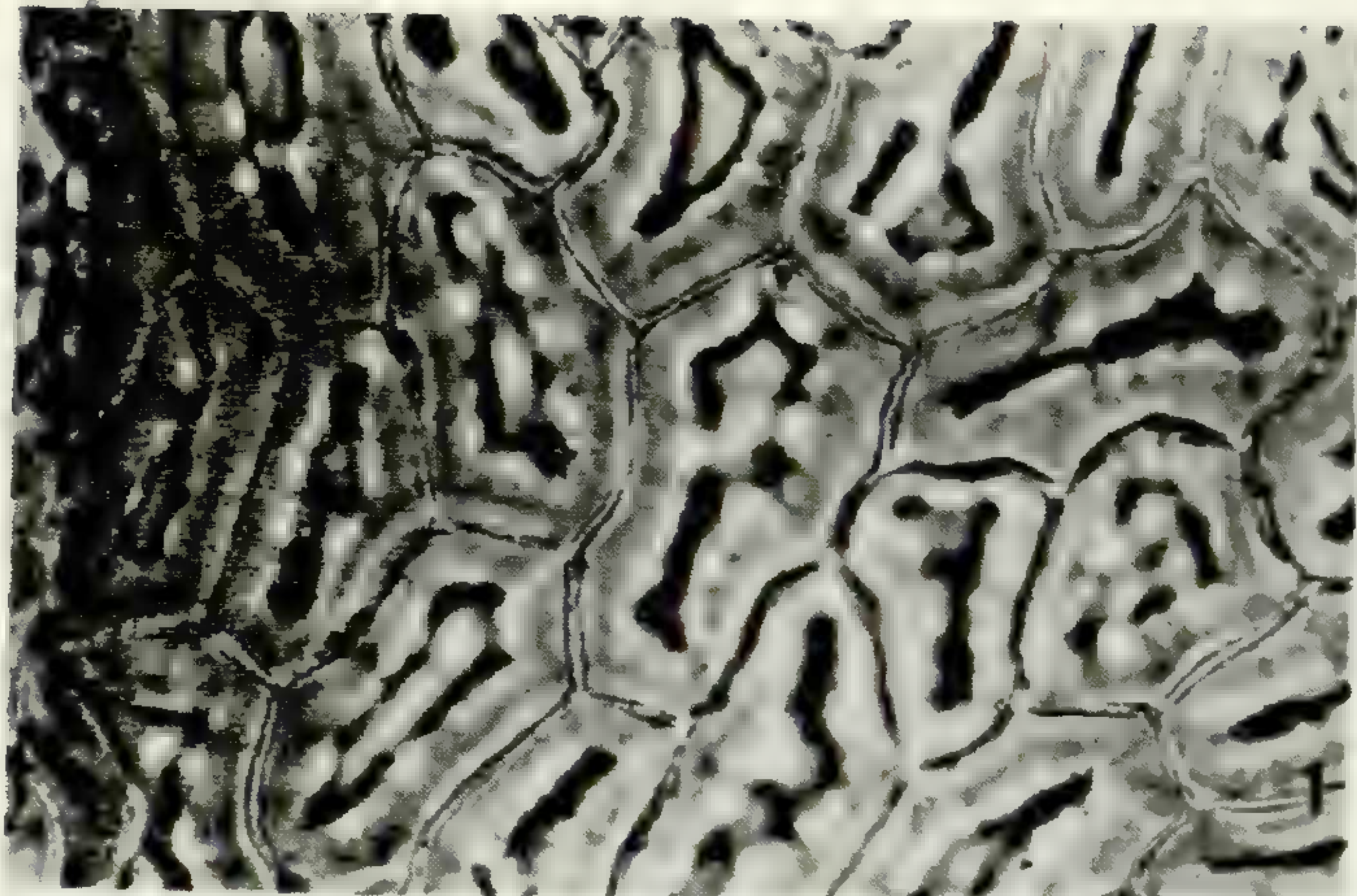


PLANCHE I

PLATE II

Seed coat patterns as seen under a light microscope :

- FIG. 1. — *Gardenia coronaria* sensu Trimen, × 120.
FIG. 2. — *Gardenia latifolia* sensu Trimen, × 250.
FIG. 3. — *Aidia cochinchinensis* Lour., × 250.
FIG. 4. — *Aidia gardneri* (Thw.) Tirvengadum, new combination, × 250.
FIG. 5. — “*Randia*” *rugulosa* (Thw.) Hook. f. (from India), 250.
FIG. 6. — “*Xeromphis*” *malabarica* (Lam.) Raju, × 250.
FIG. 7. — *Oxyceros horrida* Lour., × 250.
FIG. 8. — “*Randia*” *rugulosa* (Thw.) Hook. f. (from Sri Lanka), 250

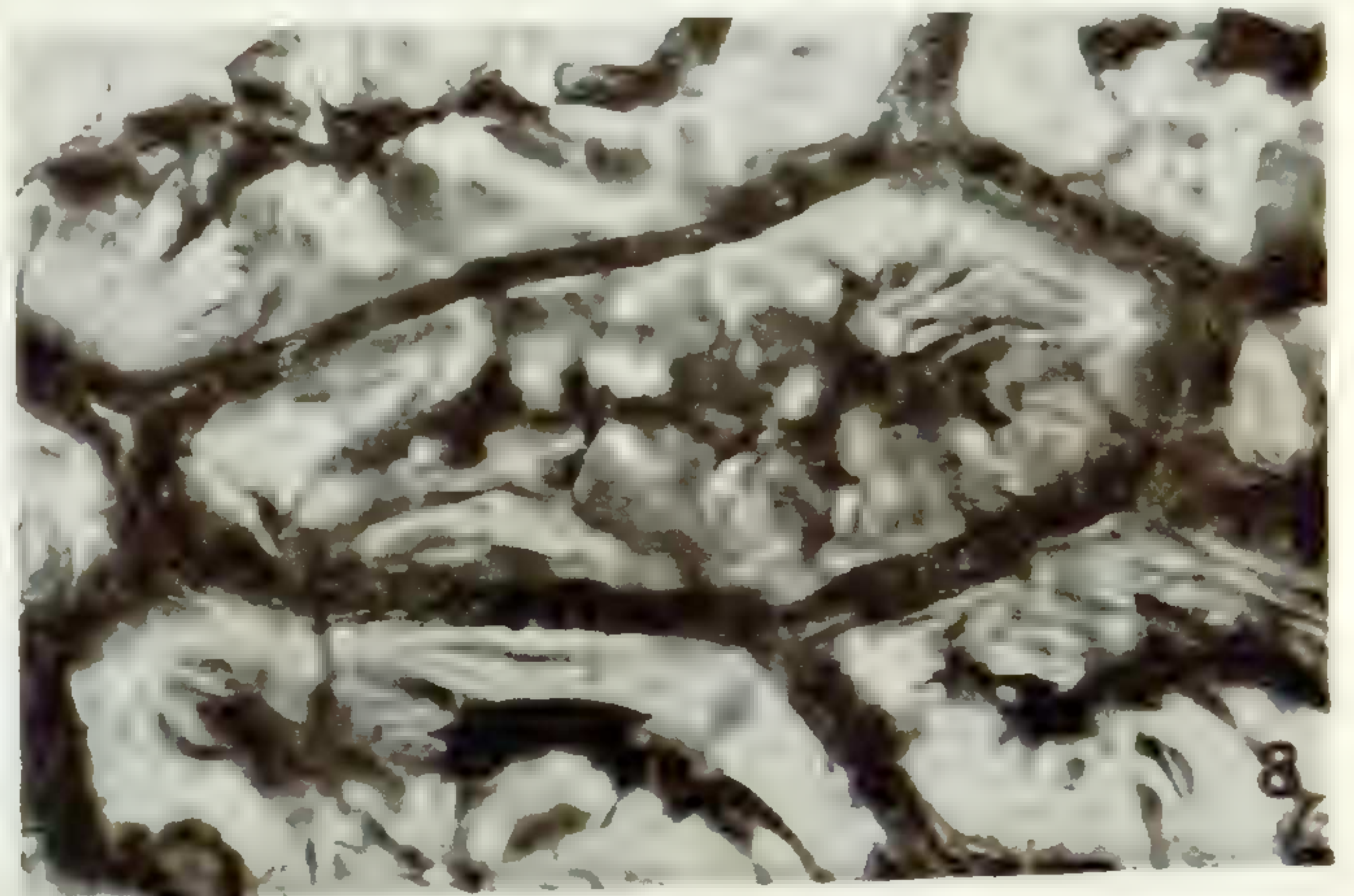
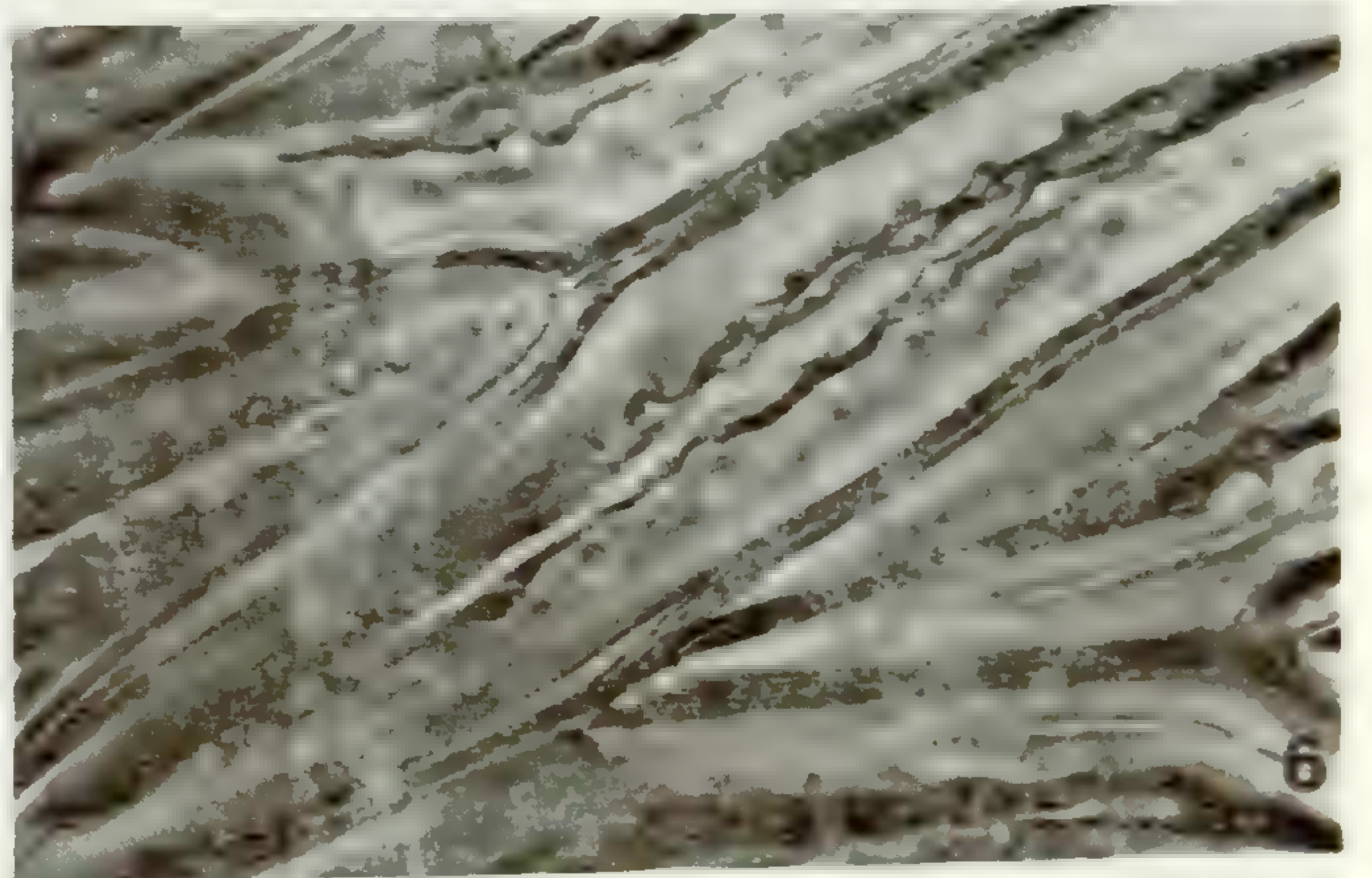
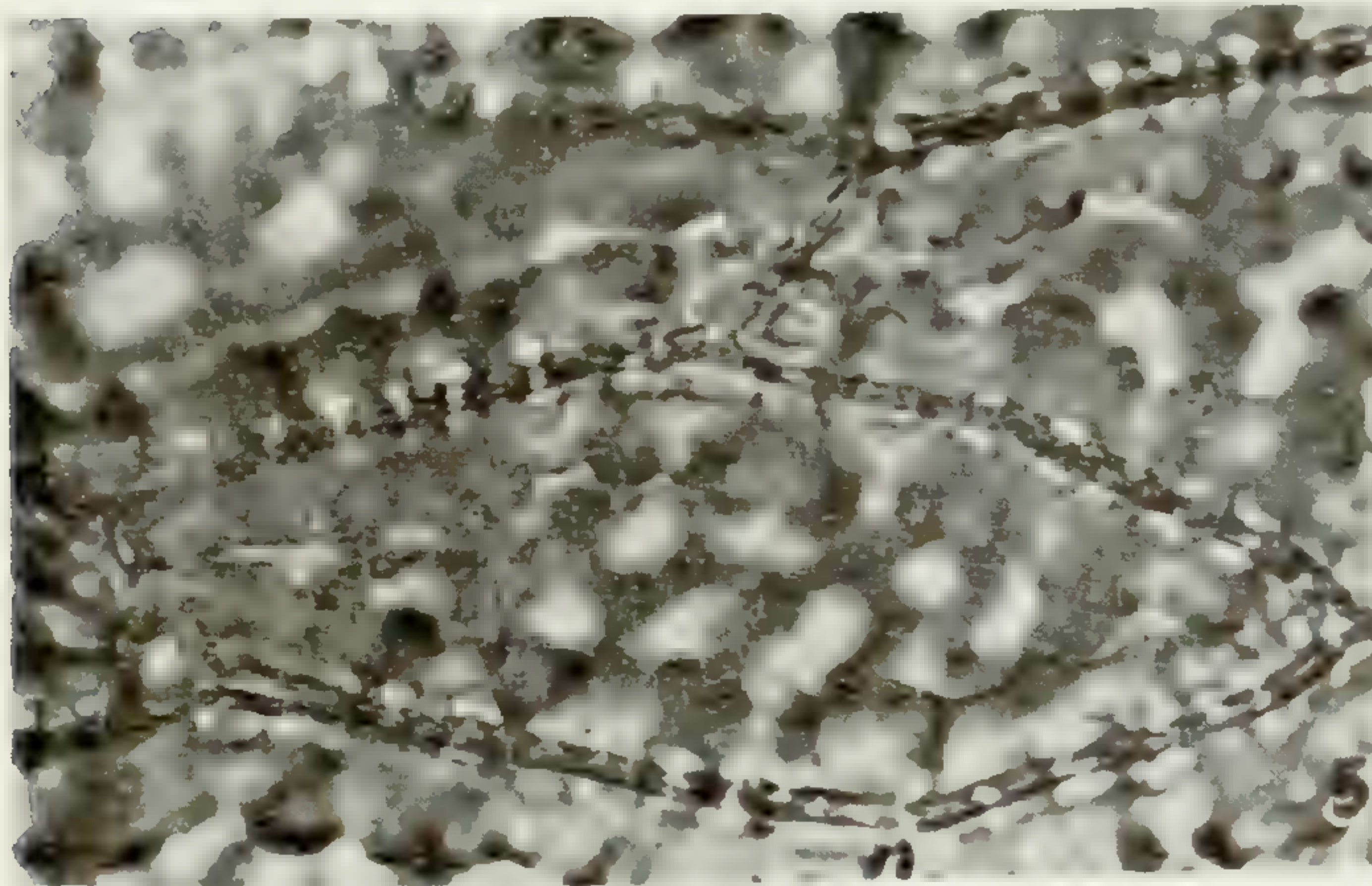
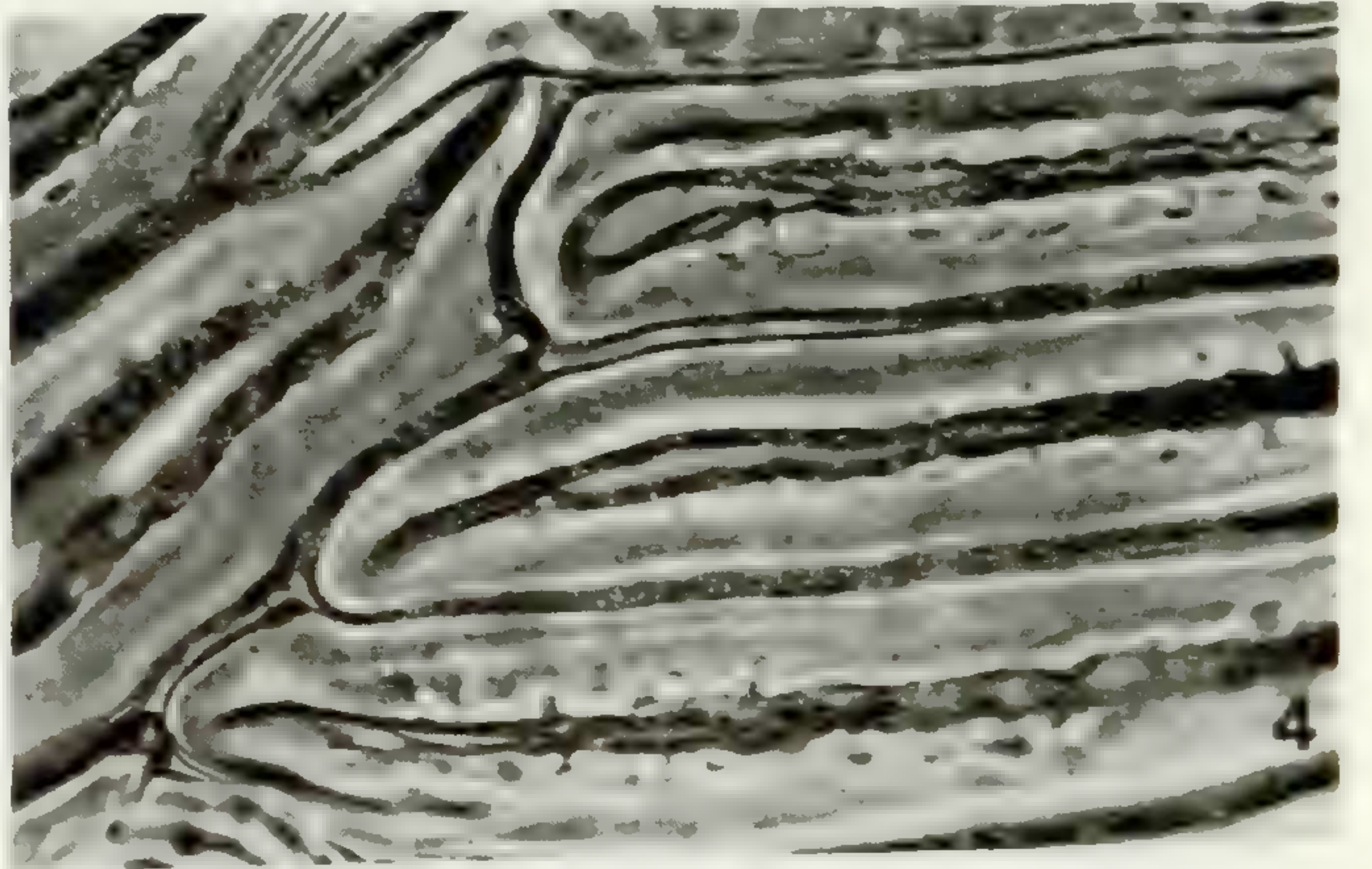
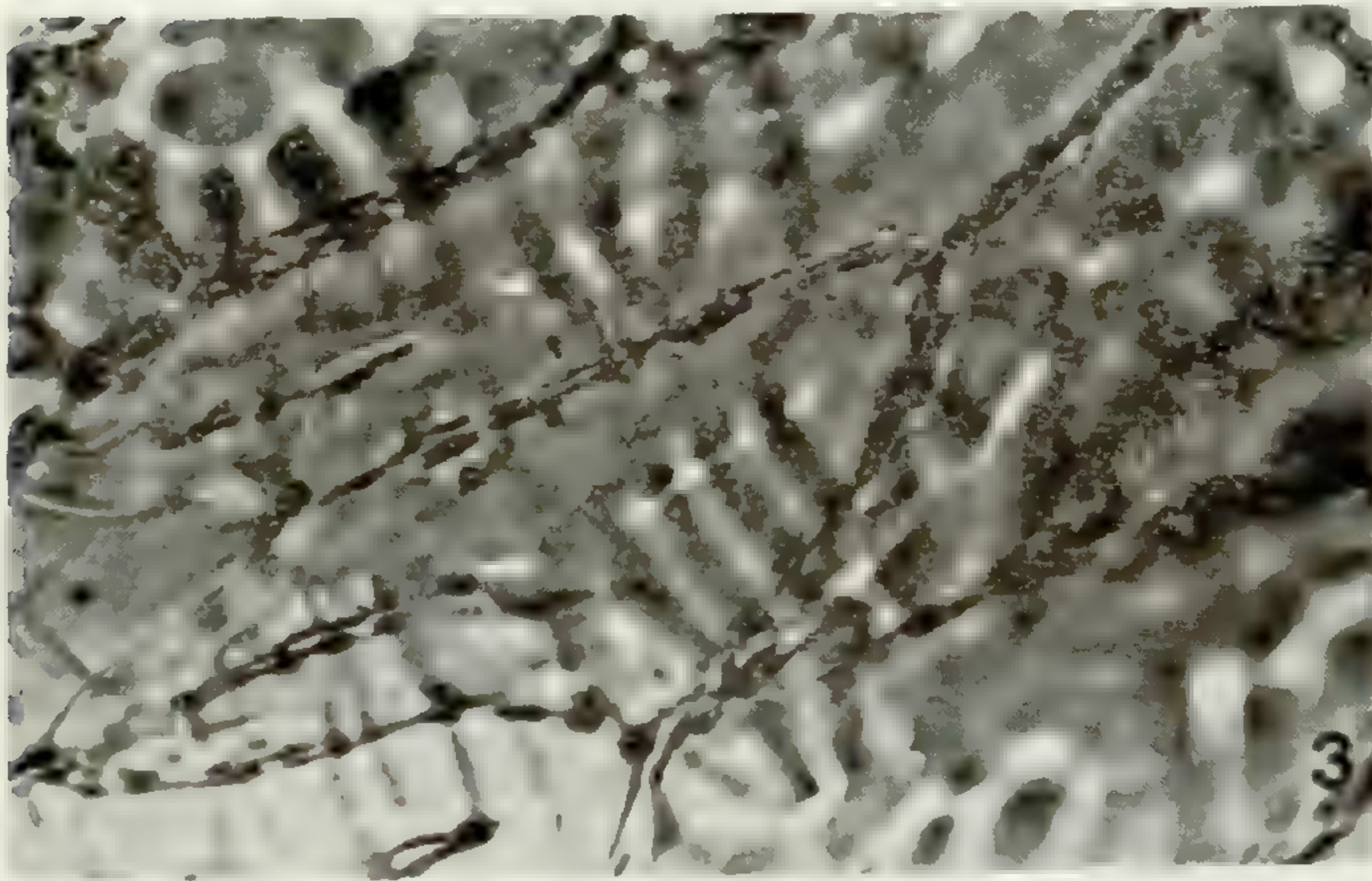
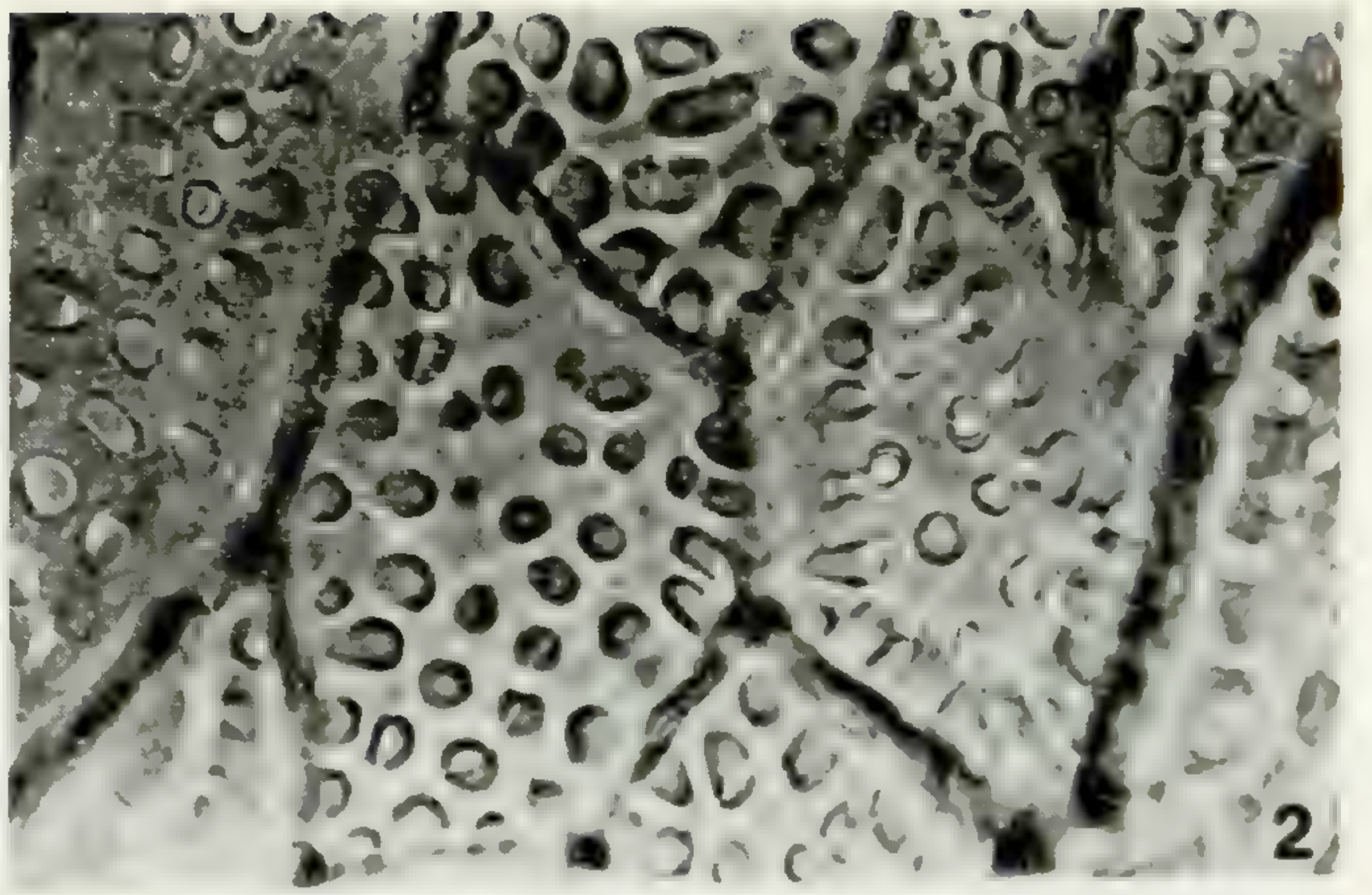
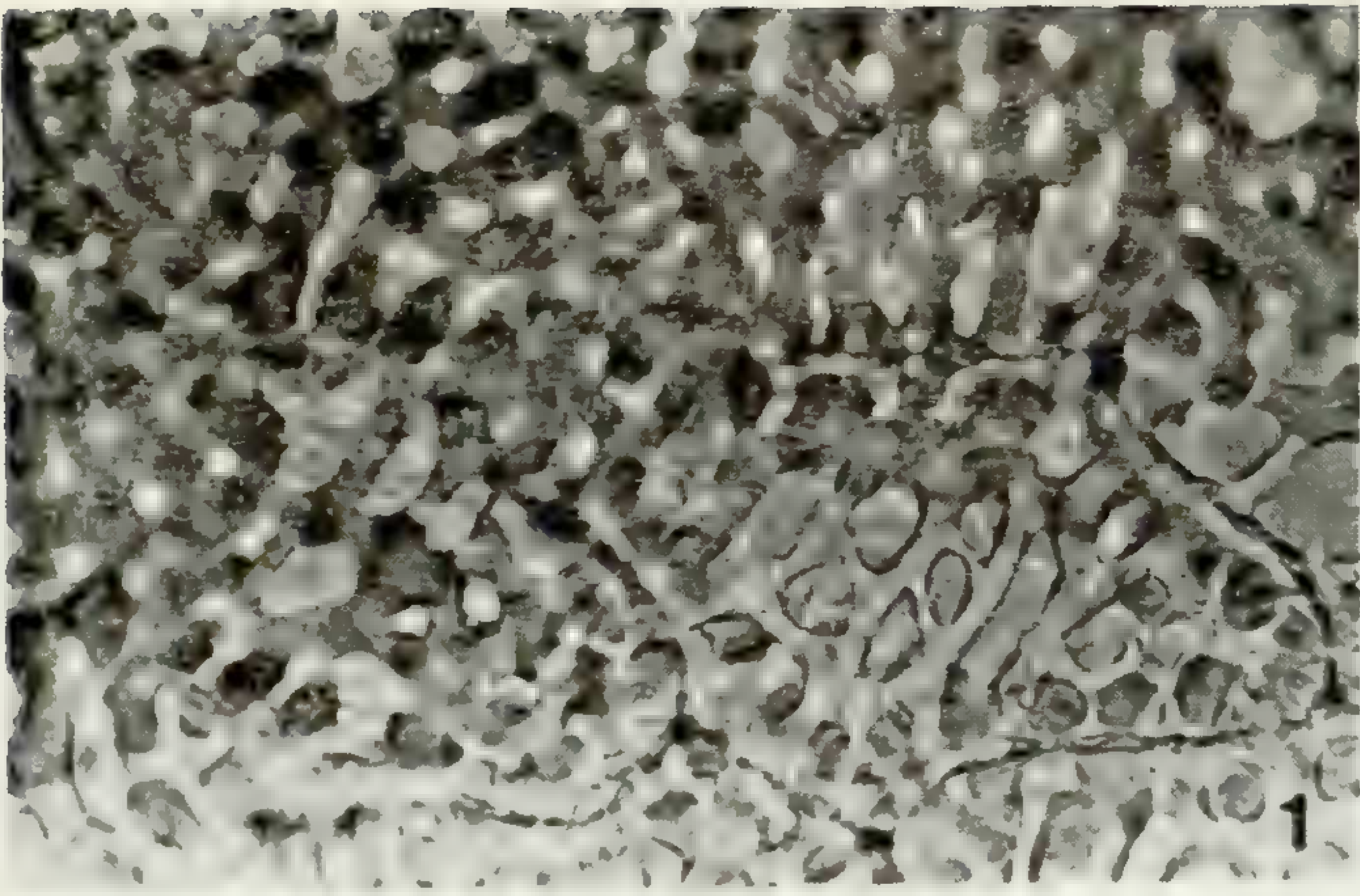


PLANCHE II

PLATE III

Representative specimens of *Ceriscoides turgida* (Roxb.) Tirvengadam, new combination.

FIG. 1. — Above : Flowering shoot with buds ; detached staminate (dioecious) flowers (Stocks s.n., from India, K). — Below : Cross section of mature fruit showing clearly the points of attachment of the parietal placentas on the wall (Ritchie in Herb. Stocks, K).

FIG. 2. — Flowering shoot with solitary pistillate (dioecious) flower (Hort. Bot. Calcutta s.n. from India, K).



PLATE IV

- FIG. 1. — Representative specimen of *Ceriscoides campanulata* (Roxb.) Tirvengadum, new combination (Wallich 8279, with J. Hooker & Thomson s.n. both from India, K).
- FIG. 2. — Type specimen : holotype of *Ceriscoides mamillata* (Craib) Tirvengadum, new combination (Kerr 16750, K).



PLATE V

Representative specimens of *Ceriscoides sessiliflora* (Wall. ex Kurz) Tirvengadum, new combination.

FIG. 1. — Flowering shoot with polygamo-monoecious flowers ; staminate flowers in fascicles ; pistillate ones solitary (*Kerr 587*, from Thailand, K).

FIG. 2. — Fruiting specimen (*Kurz 3095*, from Burma, K).



1



2